

Tri-Start TV-CTV

MIL-DTL-38999 Series III

EN3645 subminiature cylindrical connectors

High performance threaded cylindrical connectors

Amphenol



Connecting people + technology

www.amphenol-socapex.com

NOTES

Notes section with horizontal lines for writing.

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ABOUT US



ABOUT AMPHENOL SOCAPEX

Amphenol
Socapex

For over 65 years, **Amphenol Socapex** has been providing rugged and reliable connectors and interconnect solutions to a large base of customers worldwide in the military, aerospace and industrial markets.

Our products and solutions, designed for rugged and unique situations involving extreme conditions, provide the innovativeness and flexibility essential to meet the needs and requirements of these demanding sectors.

Headquartered in the Technic Valley between Geneva and Mont-Blanc, **Amphenol Socapex** has 30,000 m² of manufacturing capacity. Our in-house molding, machining, screw machining & assembly capabilities within our 2 facilities in France & India give us the ability to manage all types of volume with consistent quality.

More info on www.amphenol-socapex.com

Amphenol Socapex is part of Amphenol Group.



Thyez (74), France



Manufacturing site in Pune, India

ABOUT AMPHENOL

Amphenol

Founded in 1932, **Amphenol** is one of the largest manufacturers of interconnect products in the world. The company designs, manufactures, and markets electrical, electronic, and fiber optic connectors, interconnect systems, and coaxial and specialty cables.

Amphenol products are engineered and manufactured in the Americas, Europe, Asia and Africa and sold by a worldwide sales and marketing organization.

Amphenol has a diversified presence as a leader in high growth areas of the interconnect industry and provides solutions for customers in the automotive, broadband, industrial, information technology and data communications, military and aerospace, mobile devices, and mobile networks markets.

More info on www.amphenol.com

AMPHENOL SOCAPEX QUALITY & ENVIRONMENTAL CERTIFICATION

Quality certification :

ISO 9001 : 2000

Thyez (France) and Pune (India)


Aeronautical market quality certification :

EN9100 : 2003

Thyez (France) and Pune (India)


Military market quality certification (NATO) :

AQAP 2110

Thyez (France)


Environnemental certification :

ISO 14001 (2004)

Thyez (France)



CONNECTOR RANGE & ACCESSORIES

STANDARD

TV METALLIC SHELLS



CTV COMPOSITE SHELLS



RANGE DERIVATED

REDUCED FLANGE



STAND OFF RECEPTACLE



TVS-Y/TVS-YN HERMETIC



BREAKAWAY CONNECTORS



THRU-BULKHEAD RECEPTACLES



RECEPTACLES WITH ENHANCED SEALING



INTEGRATED BACKSHELLS

MIL-DTL-38999
OPTICAL
CONNECTORS

TVOP



STARTOP



ACCESSORIES

BACKSHELLS



PROTECTIVE CAPS



TECHNICAL CHARACTERISTICS

GENERAL CHARACTERISTICS

TV-CTV CONNECTORS (MIL-DTL-38999 SERIES III/EN3645)

- MIL-DTL-38999 series III connectors
- EN3645 connectors
- Dedicated to harsh environment applications
- 9 shell sizes (from 09 to 25)
- Thread coupling
- 100% scoop-proof
- More than 80 contact arrangements
- Intermountable with MIL-DTL-38999 series I



AMPHENOL ADDED VALUE

Amphenol goes further the European and American standards by offering an extended range with:

- Inserts compatible with quadrax
- Grounded connectors with conductive insert for specific use
- Receptacles with reinforced sealing
- Hermetic version in Y & N classes
- High density inserts (with size 23 contacts)
- Filtered versions using tubular or planar technology

MAIN FEATURES

SHELL MATERIAL AND PLATING:

- | | |
|-------------------|---|
| • Aluminium | Standard material |
| • Composite | Lightweight solution up to 70%weight saving
Corrosion resistant up to 2000H of salt spray exposure |
| • Stainless steel | Firewall capability |
| • Marine bronze | High corrosion resistance
Robustness for marine applications |

PLATING:

- Olive drab cadmium
- Nickel
- Passivation
- Black zinc nickel

CONTACTS

- Standard contacts plated with a minimum of 1.27µm gold
- Size 00, 4, 8, 10, 12, 16, 20, 22D, 23
- Signal, power, twinax, coax, quadrax and optical termini

Contact protection: interfacial seal ensures sealing around each contact and prevents electrolytic erosion



OTHERS

Quick coupling

- Mate and self-lock in a 360° turn of the coupling nut
- Anti-decoupling device for high vibration performance

EMI/RFI protection:

- Shell to shell bottoming
- Grounding fingers on the plug shell

APPLICATIONS

Military and aeronautic applications:

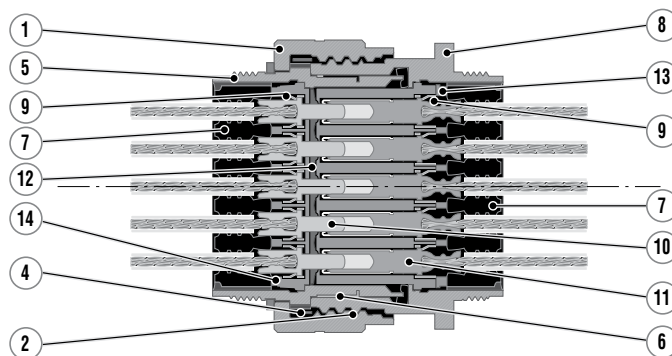
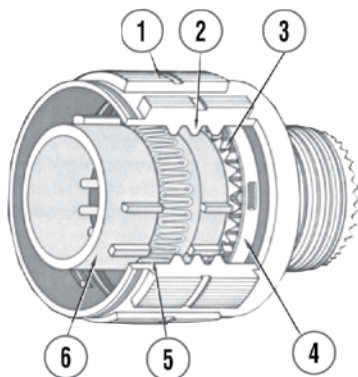
battlefield, ground vehicles, aircrafts, communication systems...

Advanced industrial applications:

high vibration requirements, high density

TECHNICAL CHARACTERISTICS

MECHANICAL CHARACTERISTICS



- 1 Coupling nut
- 2 Quick coupling thread
- 3 Ratchet
- 4 Anti decoupling device
- 5 Plug shell
- 6 Spring fingers (EMI)
- 7 Grommet

- 8 Receptacle shell
- 9 Contact retention clips
- 10 Crimping pin contact
- 11 Crimping socket contact
- 12 Interfacial seal
- 13 Socket insert
- 14 Pin insert

- Thermoplastic insert
- Silicone rubber back insert and interfacial seal
- **Durability:** - 500 cycles
- 1500 cycles with composite connector "CTV" fitted with "H" and "J" contact types
- **Shocks:** half sine wave of 300 G magnitude during 3ms per EIA364.27
- **Sine vibrations:** - 60 g from - 55°C to + 175°C (olive drab cadmium finish)
- 60 g from - 55°C to +200°C (nickel finish and firewall version)
- **Random vibrations per EIA364.28:** - 1 G² / Hz at 175°C olive drab cadmium finish
- 1G² / Hz at 200°C nickel finish and firewall version
- 5G² / Hz at ambient
- **Bending moment**

Shell size		Bending moment Nm
MIL-DTL-38999 Series III	Amphenol	
A	09	11.3
B	11	33.9
C	13	45.2
D	15	56.5
E	17	67.8
F	19	79.1
G	21	90.4
H	23	101.7
J	25	113.0

• Contact retention force

Contact Size	23	22D	20	16	12	8	4
Maximum load (N)	44	44	67	111	111	111	150

TECHNICAL CHARACTERISTICS

ENVIRONMENTAL CHARACTERISTICS

• Salt spray exposure and working temperature:

• Waterproof shells

Shell material	Shell finish	Salt spray exposure per EIA364.26	Class norm	Amphenol	Operating temperature		Shell to shell Conductivity
					mini	maxi	
Composite	Electroless Nickel O.D cadmium	2000 H 2000 H	M J	CTV-RF CTV-RW	-65°C	+200°C*	3mΩ
					-65°C	+175°C	3mΩ
Aluminium	Electroless Nickel O.D cadmium Duralon (Ni-PTFE) Green Zinc Cobalt Black Zinc Nickel	48 H 500 H 500H 96H 500H	F W T - Z	TVS-RF TV-RW TV-DT TV-RZ TV-ZN TV-DZ	-65°C	+200°C*	1mΩ
					-65°C	+175°C	2.5mΩ
					-65°C	+175°C	2.5mΩ
					-65°C	+175°C	3mΩ
					-65°C	+175°C	2.5mΩ
Stainless steel	Nickel —	500 H 500 H	S K	TVS-RS TVS-RK	-65°C	+200°C*	1mΩ
					-65°C	+200°C*	10mΩ
Bronze	—	500 H		TVS-RB	-65°C	+200°C*	5mΩ

• Hermetic shells

Shell materiel	Shell finish	Salt spray exposure per EIA364.26	Class norm	Amphenol	Operating temperature	
					min	max
Stainless steel	Nickel -	48 H 500 H	N Y	TVS-YN TVS-Y	-65°C	+200°C*
					-65°C	+200°C*

* 175°C maxi only for high-density contact arrangements

• **Humidity:** per MIL-DTL-38999: § 3.29

• **Altitude immersion:** according to MIL-DTL-38999 III standard (except hermetics)

• **Air leakage** < 1.10⁻⁷ cm³/s under 1 bar of differential pressure (hermetics only)

• Fluid immersion per EIA364.10:

- Hydraulic fluid, per MIL-H-5606
- Turbine fluid, grade JP-8, per MIL-DTL-83133 (NATO TYPE 34)
- Lubricating oil, per MIL-L-7808
- Lubricating oil, per MIL-PRF-23699
- Defrosting fluid, per MIL-A-8243
- Cleaning compound, diluted for cleaning, per MIL-PRF-87937 type I alkaline base

- Gasoline, per ASTM-D-4814
- Gasohol, per A-A-52530
- One part isopropyl alcohol, per TT-I-735, grade A or B ; and 3 parts mineral spirits, per A-A-2904, type II, grade A or P-D-680, type I, by volume
- Coolant, dielectric fluid, synthetic silicate ester base MIL-PRF-47220 (Coolanol 25) or equivalent
- Hydraulic fluid M2-V Chevron oil ST0145LB0001 or equivalent

TECHNICAL CHARACTERISTICS ELECTRICAL CHARACTERISTICS

• Contact rating - nominal current per contact

Contact size	23 *1	22 D	20	16	12	8	4	00
Crimp (A)	5	5	7.5	13	23	60	100	230
Hermetic (A)	3	3	5	10	17	-	-	-
PC Tail (A)	3	3	4.5	10	17	40	-	-
Resistance	15	8	4.7	2	1.1	0.6	0.26	-

• Contact resistance

Contact Size	23 *1	22D	20	16	12	8	4
Resistance (mΩ)	15	8	4.7	2	1.1	0.6	0.26

- Insulation resistance
 - at ambient > 5.10³ Mohms
 - at maximum temperature > 10³ Mohms

• Service rating

Service	Dielectric withstanding voltage (Vrms)								Working voltage	
	At sea level		15000 meters		21000 meters		34000 meters			
	mated	unmated	mated	unmated	mated	unmated	mated	unmated	Vrms	Vdc
M	1300	1300	800	550	800	350	800	200	400	550
I	1800	1800	1000	600	1000	400	1000	200	600	850
II	2300	2300	1000	800	1000	500	1000	200	900	1250

• Dimensions of acceptable contacts and cables

Contact Size	Contact Diameter mm	Crimp barrel		Acceptable cables						
		Diameter mm	Depth mm	Gauge AWG Section mm²				Outside diameter (mm)		
								Min	Average	Max
23 *1	0,68	0,88 ± 0,03	3,81	22	24	26	28	-	-	1.2
				0.38	0.22	0.15	0.095			
22D	0.76	0.88 ± 0.03	3.58	22	24	26	28	0.76	1.20	1.37
				0.38	0.22	0.15	0.095			
20	1	1.19 ± 0.03	5.30	20	22	24	-	1.02	1.83	2.11
				0.60	0.38	0.22	-			
16	1.57	1.70 ± 0.03	5.30	16	18	20	-	1.68	2.41	2.77
				1.34	0.93	0.60	-			
12	2.36	2.54 ± 0.06	10	12	14	-	-	2.46	3.20	3.61
				3.30	1.94	-	-			
8	3.60	4.6 ± 0.05	10	8				4.50	-	5.2
				8.98 Max acceptable: 10mm²						
4	5.70	7.4 ± 0.05	12	4				7.73	-	8.4
				21.10						

*1 High-Density arrangements

TECHNICAL CHARACTERISTICS

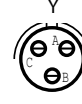
INSERT ARRANGEMENTS

Contact Size	23 (high density)	22D	20	16	12	8	4
Caption							
Available:							
Coax	-	-	-	✓	✓	✓	-
Differential Twinax	-	-	-	-	-	✓	-
Quadax	-	-	-	-	-	✓	-
Power contacts	-	-	-	✓	✓	✓	✓
Grounded cavity	-	-	-	✓	✓	✓	-

Front face of male insert. (Only the major keyway is illustrated)

- 1 MIL-DTL-38999 Series III / EN3645 insert arrangement reference
- 2 TV-CTV insert arrangement
- 3 Service class
- 4 Number of contacts
- 5 Contact sizes

09



1	- / 09G01		A 35 / 09N35		A 98 / 09N98
2	09-05	09-09	09-35	09-94	09-98
3	N/A		M	M	I
4	1	9	6	2	3
5	8 Twinax°	23	22D	20	20

11



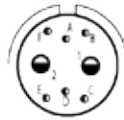
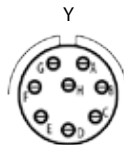
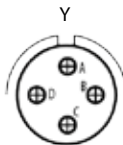
1	- / 11N01	B 2 / 11N02	- / 11N04	B 5 / 11N05	- / 11N12
2	11-01	11-02	11-04	11-05	11-12
3		I	I	I	II
4	1	2	4	5	1
5	8 Twinax°	16	20	20	12

11



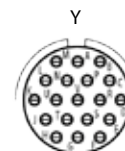
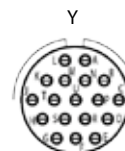
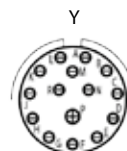
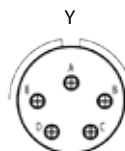
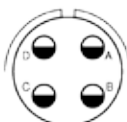
1		B 35 / 11N35	B 98 / 11N98	B99 / 11N99
2	11-19	11-35	11-98	11-99
3		M	I	I
4	19	13	6	7
5	23	22D	20	20

13



1	C 4 / 13N04	C 8 / 13N08	- / 13N26	C 35 / 13N35	C 98 / 13N98
2	13-04	13-08	13-26	13-35	13-98
3	I	I	M	M	I
4	4	8	6 2	22	10
5	16	20	22D 12	22D 23	20

15



1		D 05 / 15N05	D 15 / 15N15	D 18 / 15N18	D 19 / 15N19
2	15-04	15-05	15-15	15-18	15-19
3	I	M	I	I	I
4	4	5	14 1	18	19
5	12	16	20 16	20	20

TECHNICAL CHARACTERISTICS

Contact Size	23 (high density)	22D	20	16	12	8	4
Caption							
Available:							
Coax	-	-	-	✓	✓	✓	-
Differential Twinax	-	-	-	-	-	✓	-
Quadrax	-	-	-	-	-	✓	-
Power contacts	-	-	-	✓	✓	✓	✓
Grounded cavity	-	-	-	✓	✓	✓	-

INSERT ARRANGEMENTS

Front face of male insert. (Only the major keyway is illustrated)

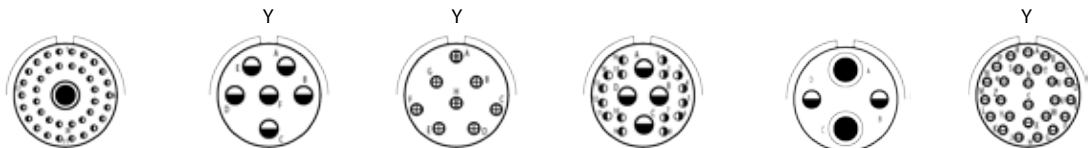
- 1 MIL-DTL-38999 Series III / EN3645 insert arrangement reference
- 2 TV-CTV insert arrangement
- 3 Service class
- 4 Number of contacts
- 5 Contact sizes

15



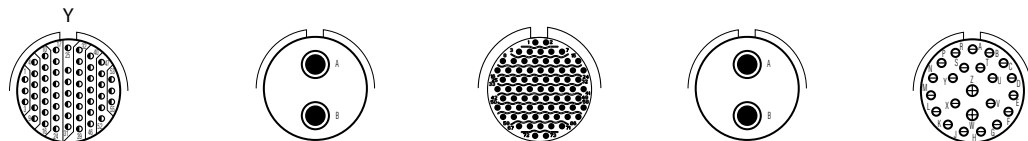
1	D 35 / 15N35		D 97 / 15N97	
2	15-25**		15-55	
3	M		I	
4	22	3	8	4
5	22D	16	20	16

17



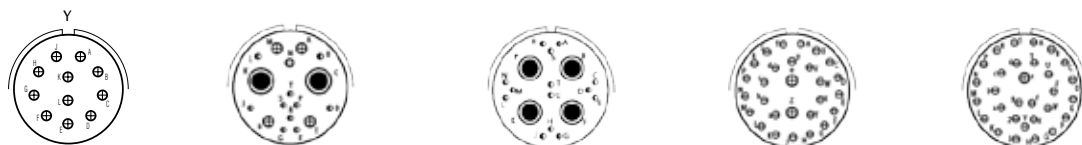
1	E 2 / 17N02		E 6 / 17N06		E 8 / 17N08		- / 17N20		- / 17N22		E 26 / 17N26	
2	17-02		17-06		17-08		17-20**		17-22		17-26	
3	M		I		II		M		M		I	
4	38	1	6	8	16	4	2	2	2	2	26	20
5	22D	8 Twinax ^o	12	16	22D	12	12 Coax	8 Twinax ^o	8 Twinax ^o	8 Twinax ^o	20	20

17



1	E 35 / 17N35		- / 17N75		E 99 / 17N99	
2	17-35		17-75		17-99	
3	M		M		I	
4	55	2	73	2	21	2
5	22D	8 Quadrax (meets 17-82 Boeing spec)	23	8 Twinax ^o	20	16

19



1	F 11 / 19N11		- / 19N17		F 18		19-28		19-30	
2	19-11		19-17		19-18		19-28		19-30	
3	II		M		M		I		I	
4	11	10	1	4	14	4	26	2	29	1
5	16	22D	20	16	22D	8 Twinax ^o	20	16	20	16

19



1	- / 19N31		F 32 / 19N32		F 35 / 19N35		19-88	
2	19-31		19-32		19-35		19-88	
3	M		I		M		I	
4	2	1	12	32	66	88	88	88
5	8 Coax	12	22D	20	22D	23	23	23

TECHNICAL CHARACTERISTICS

INSERT ARRANGEMENTS

Contact Size	23 (high density)	22D	20	16	12	8	4
Caption							
Available:							
Coax	-	-	-	✓	✓	✓	-
Differential Twinax	-	-	-	-	-	✓	-
Quadax	-	-	-	-	-	✓	-
Power contacts	-	-	-	✓	✓	✓	✓
Grounded cavity	-	-	-	✓	✓	✓	-

Front face of male insert. (Only the major keyway is illustrated)

- 1 MIL-DTL-38999 Series III / EN3645 insert arrangement reference
- 2 TV-CTV insert arrangement
- 3 Service class
- 4 Number of contacts
- 5 Contact sizes

21

1 G 11 / 21N11	2 G 16 / 21N16	3 - / 21N20	4 G 35 / 21N35	5 G 39 / 21N39
2 21-11	21-16	21-AJ	21-35	21-39
3 I	II	M	M	I
4 11	16	18 2	79	37 2
5 12	16	20 8 twinax°	22D	20 16

21

1 G 41 / 21N41	2 21-48	3 G 75 / 21N75	4 21-121
2 21-41	21-48	21-75	21-121
3 I	M	M	
4 41	4	4	121
5 20	8 power	8 coax or 8 twinax*°	23

Quadax not available

23

1 - / 23N06	2 23-14	3 H 21 / 23N21	4 H 35 / 23N35
2 23-06	23-14	23-21	23-35
3 M	I	II	M
4 6	14	21	100
5 8 twinax°	12	16	22D

23

1 H 53 / 23N53	2 - / 23N54	3 H 55 / 23N55	4 23-151
2 23-53	23-54	23-55	23-151
3 I	M	I	
4 53	40 9 4	55	151
5 20	22D 16 12	20	23

TECHNICAL CHARACTERISTICS

Contact Size	23 (high density)	22D	20	16	12	8	4
Caption							
Available:							
Coax	-	-	-	✓	✓	✓	-
Differential Twinax	-	-	-	-	-	✓	-
Quadrax	-	-	-	-	-	✓	-
Power contacts	-	-	-	✓	✓	✓	✓
Grounded cavity	-	-	-	✓	✓	✓	-

INSERT ARRANGEMENTS

Front face of male insert. (Only the major keyway is illustrated)

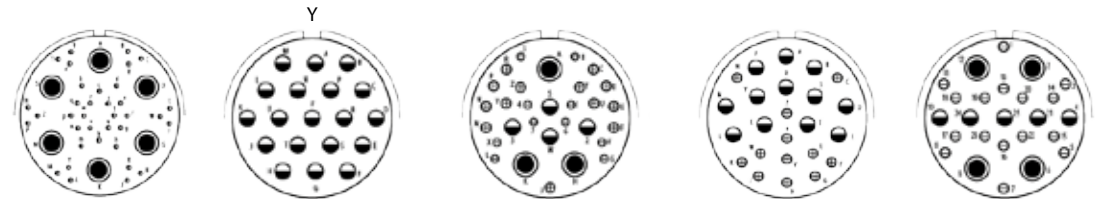
- 1 MIL-DTL-38999 Series III / EN3645 insert arrangement reference
- 2 TV-CTV insert arrangement
- 3 Service class
- 4 Number of contacts
- 5 Contact sizes

25



1	J 4 / 25N04	J 7 / 25N07	J 8 / 25N08	J 11 / 25N11	25-1A
2	25-04	25-07	25-08	25-11	
3	I	M	M	N	I
4	48	8	97	2	4
5	20	16	22D	8 twinax ^o	16

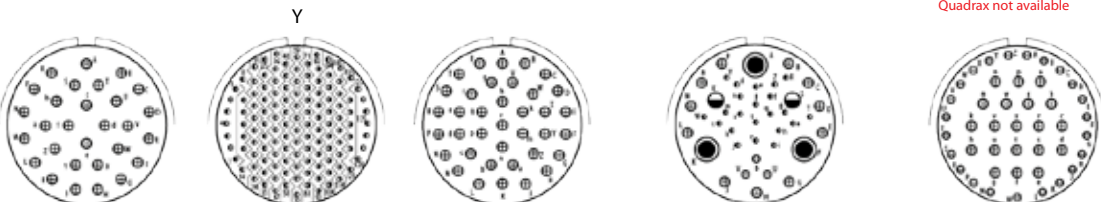
25



1	- / 25L17	J 19 / 25N19	J 20 / 25N20	J 24 / 25N24	- / 25N26
2	25-17	25-19	25-20	25-24	25-26
3	M	I	N	I	I
4	36	6	10	12	16
5	22D	8 twinax ^o	13	16	20

Quadrax not available

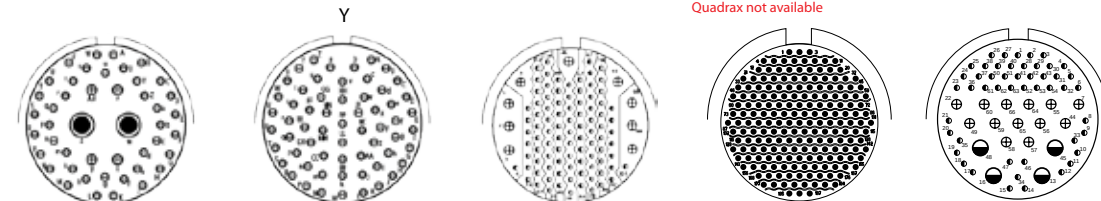
25



1	J 29 / 25N29	J 35 / 25N35	J 37 / 25N37	25-41	J 43 / 25N43
2	25-29	25-35	25-37		25-43
3	I	M	I	I	I
4	29	128	37	22	23
5	16	22D	16	20	20

Quadrax not available

25



1	J 46 / 25N46	J 61 / 25N61	25-92**	25-187	25-F4
2	25-46	25-61			Size 22D=M, Balance =I
3	I	I	M		
4	40	61	92	187	49
5	20	20	22D	23	22D

* Military P/N delivered with 8 twinax and proprietary P/N delivered with size 8 coaxial contacts for RG 180 and RG 195 wire.

** Not available in composite version.

Y Available in hermetic version.

O Delivered with twinax contacts for simple braid cable (M17/1760002, AECMA Pr EN 3375 - 003, Raychem 10612, EPD44690, EPD44691).

Δ Delivered with twinax contacts for double braid cable (PAN 6421, AECMA Pr EN 3375 - 004, Raychem 10613, EPD44692, EPD44693).

TECHNICAL CHARACTERISTICS

INSERT ARRANGEMENTS

Arrangements	Service Class	Total number of contacts	Number and size of contacts											Grounded insert availability**		Quadrax available
			23	22D	20	16	12	12 coax	10 power	8 power	8 coax	8 triax or twinax	4 power	P	S	
09-05*	N/A	1										1		X	X	X
09-09		9	9													
09-35	M	6		6												
09-94	M	2			2											
09-98	I	3			3											
11-01		1										1				X
11-02	I	2				2								X	X	
11-04	I	4			4											
11-05	I	5			5											
11-12	II	1					1									
11-19		19	19													
11-35	M	13		13												
11-98	I	6			6											
11-99	I	7			7											
13-04	I	4				4								X		
13-08	I	8			8											
13-26	M	8		6			2									
13-32		32	32													
13-35	M	22		22												
13-98	I	10			10											
15-04	I	4					4									
15-05	II	5				5								X		
15-15	I	15			14	1										
15-18	I	18			18											
15-19	I	19			19											
15-25	M	25		22		3										
15-35	M	37		37												
15-55		55	55													
15-97	I	12			8	4										
17-02	M	39		38								1				X
17-06	I	6					6							X		
17-08	II	8				8								X	X	
17-20	M	20		16			4									
17-22		4						2				2		X	X	X
17-26	I	26			26											
17-35	M	55		55												
17-52	I	2												X	X	X
17-73		73	73													
17-75	M	2										2				X
17-99	I	23			21	2										
19-11	II	11				11								X	X	
19-17	M	17		10	1	4						2				X
19-18	M	18		14								4				X
19-28	I	28			26	2										
19-30	I	30			29	1										
19-31	M	15		12			1				2					X
19-32	I	32			32											
19-35	M	66		66												
19-88		88	88													
21-11	I	11					11									
21-16	II	16				16								X		
21-AJ	M	20			18							2				X
21-35	M	79		79												
21-39	I	39			37	2										
21-41	I	41			41											
21-48		4								4						
21-75 ^o	M	4									4	or 4		X	X	X
21-121		121	121													

Legend:

*

**

o

High-Density arrangements

Only grounded insert version available

Grounded version (metallic insert for use with coaxial, twinax or quadrax contacts, for receptacle only).

21-75 delivered with TWINAX contacts when ordered under the Mil P/N

For CTV: 15-25& 17-20 arrangements not available

TECHNICAL CHARACTERISTICS INSERT ARRANGEMENTS

Arrangements	Service Class	Total number of contacts	Number and size of contacts											Grounded insert availability**		QuadraX available
			23	22D	20	16	12	12 coax	10 power	8 power	8 coax	8 triax or twinax	4 power	P	S	
23-06	M	6										6		X	X	X
23-14	I	14					14									
23-21	II	21				21								X	X	
23-35	M	100		100												
23-53	I	53			53											
23-54	M	53		40		9	4									
23-55	I	55			55											
23-151		151	151													
25-04	I	56			48	8										
25-07	M	99		97								2				X
25-08	M	8										8		X	X	X
25-11	N	11			2				9							
25-1A		8				4							4			
25-17	M	42		36								6				X
25-19	I	19					19							X		
25-20	N	30			10	13		4*				3				X
25-24	I	24				12	12									
25-26	I	25			16		5				4					
25-29	I	29				29								X		
25-35	M	128		128												
25-37	I	37				37										
25-41	I	41		22	3	11		2*				3				
25-43	I	43			23	20										
25-46	I	46			40	4					2					X
25-61	I	61			61											
25-92	M	101		92		9										
25-187		187	187													
25-F4	M	66		49		13	4									

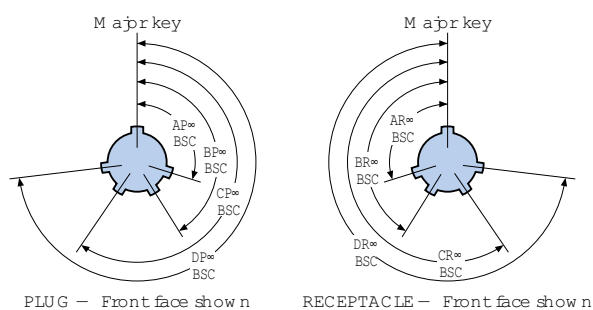
High-Density arrangements

Legend: ** Grounded version (metallic insert for use with coaxial, twinax or quadraX contacts, for receptacle only).

TECHNICAL CHARACTERISTICS CODING - POLARIZATION

To avoid cross-plugging problems in applications requiring the use of more than one MIL-DTL-38999 III connector of the same size, alternate key-rotations are available as indicated in the accompanying chart. As shown in the diagram below, the secondary keys rotate clockwise from the major one.

In the reference system, the polarization is shown by the letters N, A, B, C, D or E.



Shell size	Coding identification letter	AR° or AP° BSC	BR° or BP° BSC	CR° or CP° BSC	DR° or DP° BSC
9	N	105	140	215	265
	A	102	132	248	320
	B	80	118	230	312
	C	35	140	205	275
	D	64	155	234	304
11 and 13	E	91	131	197	240
	N	95	141	208	236
	A	113	156	182	292
	B	90	145	195	252
	C	53	156	220	255
17 and 19	D	119	146	176	298
	E	51	141	184	242
	N	80	142	196	293
	A	135	170	200	310
	B	49	169	200	244
21, 23 and 25	C	66	140	200	257
	D	62	145	180	280
	E	79	153	197	272
	N	80	142	196	293
	A	135	170	200	310
	B	49	169	200	244
	C	66	140	200	257
	D	62	145	180	280
	E	79	153	197	272

STANDARD RANGE

TV METALLIC SHELLS



ALUMINIUM SHELLS

Presentation

Aluminium TV shell connectors are used in professional and international electronic defense programs in standard environmental conditions.

Main characteristics

- Material shell: Aluminium alloy.
- Shell to shell continuity: Max resistance - 1 mΩ for F class
- 2.5 mΩ for W-Z class
- Shell to contact continuity, for grounded inserts versions: Max resistance 10 mΩ
- EMI shielding effectiveness: - 1GHz: -85 dB (Class F, W-Z)
- 10 GHz: -65 dB (Class F); -50 dB (Class W-Z)
- Standard MIL wiring tools

MARINE BRONZE SHELLS

Presentation

TVS-B bronze connectors are not defined in MIL-DTL-38999-III standard but they are based on its requirements.

TVS-B connectors conform to the European standard CECC 75.201.002. (deviation F485 to be added for plug)

This series was initially selected by the British Navy for a new generation of ships. By extension a lot of the NATO Navy choose this series as a standard of interconnection.

Main characteristics

- Material shell: Nickel aluminum bronze DGS 1043.
- EMI shielding effectiveness: < -65 dB from 100 MHz to 10 GHz.

STAINLESS STEEL SHELLS

Presentation

Stainless steel shell connectors are used in high temperature environments and in harsh vibration conditions. They provide FIREWALL capabilities.

Main characteristics

- Thermosetting insert
- Shell to shell continuity: Max resistance - 10 mΩ for Class K
- 1 mΩ for Class S
- EMI shielding effectiveness: - 1 GHz: -65 dB (Class K); -85 dB (Class S)
- 10 GHz: -45 dB (Class K); -65 dB (Class S)

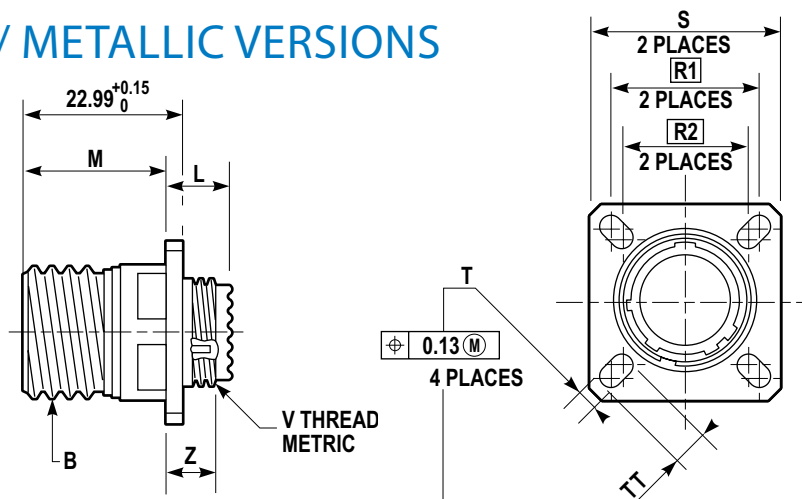
STANDARD RANGE

TV METALLIC SHELLS

OVERALL DIMENSIONS / METALLIC VERSIONS

SQUARE FLANGE RECEPTACLE

TVP00RW	JD38999/20W
TVP00ZN	JD38999/20Z
TVPS00RF	JD38999/20F
TVPS00RB	
TVPS00RK	JD38999/20K
TVPS00RS	JD38999/20S



Shell size		B thread Class 2A 0.1P-0.3L-TS (inches)	L Max (mm)	M +0.00 -0.13 (mm)	R1 (mm)	R2 (mm)	S ±0.25 (mm)	T +0.20 -0.13 (mm)	Z1 Max (mm)	TT +0.20 -0.13 (mm)	V thread metric
MIL-DTL-38999 Series III	Amphenol										
A	9	.6250	11.91	20.83	18.26	15.09	23.83	3.25	3.89	5.49	M12x1-6g
B	11	.7500	11.91	20.83	20.62	18.26	26.19	3.25	3.89	4.93	M15x1-6g
C	13	.8750	11.91	20.83	23.01	20.62	28.58	3.25	3.89	4.93	M18x1-6g
D	15	1.0000	11.91	20.83	24.61	23.01	30.96	3.25	3.89	4.39	M22x1-6g
E	17	1.1875	11.91	20.83	26.97	24.61	33.32	3.25	3.89	4.93	M25x1-6g
F	19	1.2500	11.91	20.83	29.36	26.97	36.53	3.25	3.89	4.93	M28x1-6g
G	21	1.3750	12.70	20.07	31.75	29.36	39.67	3.25	4.65	4.93	M31x1-6g
H	23	1.5000	12.70	20.07	34.93	31.75	42.88	3.91	4.65	6.15	M34x1-6g
J	25	1.6250	12.70	20.07	38.10	34.93	46.02	3.91	4.65	6.15	M37x1-6g

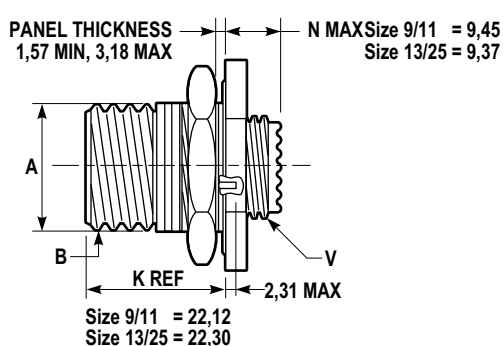
For panel drilling, see section "Printed Circuit Board Connectors"

For PCB contacts stickout, see section "Printed Circuit Board Connectors"

Maximum panel thickness for rear panel mounting:
5mm from size 21 to 25
5,8mm from size 9 to 19

JAM NUT RECEPTACLE

TV07RW	JD38999/24W
TV07ZN	JD38999/24Z
TVS07RF	JD38999/24F
TVS07RB	
TVS07RK	JD38999/24K
TVS07RS	JD38999/24S



Shell size		B thread Class 2A 0.1P-0.3L-TS (inches)	A +0.10 -0.15 (mm)	C Max (mm)	H Hex +0.43 -0.41 (mm)	S +/-0.4 (mm)	V thread metric	Hex nut max torque N.m
MIL-DTL-38999 Series III	Amphenol							
A	9	.6250	16.53	30.45	22.23	26.97	M12x1-6g	4.1
B	11	.7500	19.07	35.20	25.40	31.75	M15x1-6g	5.3
C	13	.8750	23.82	38.38	30.17	34.93	M18x1-6g	6.9
D	15	1.0000	26.97	41.55	33.32	38.10	M22x1-6g	8.6
E	17	1.1875	30.15	44.73	36.52	41.28	M25x1-6g	9.8
F	19	1.2500	33.32	49.50	39.67	46.02	M28x1-6g	10.9
G	21	1.3750	36.50	52.65	42.87	49.23	M31x1-6g	12.7
H	23	1.5000	39.67	55.85	46.02	52.37	M34x1-6g	13.8
J	25	1.6250	42.85	59.00	50.80	55.58	M37x1-6g	15

For panel drilling, see section "Printed Circuit Board Connectors"

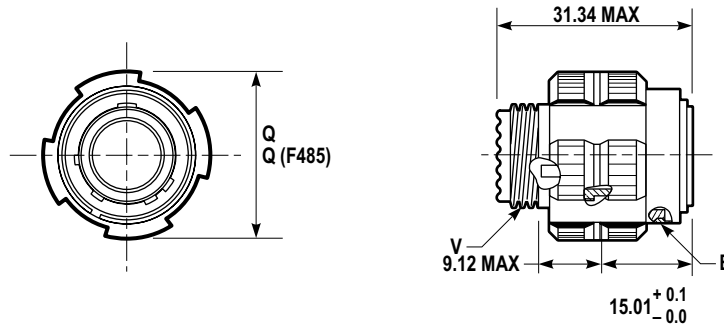
For PCB contacts stickout, see section "Printed Circuit Board Connectors"

STANDARD RANGE

TV METALLIC SHELLS

STRAIGHT PLUG

TV06RW	JD38999/26W
TV06ZN	JD38999/26Z
TVS06RF	JD38999/26F
TVS06RB	
TVS06RK	JD38999/26K
TVS06RS	JD38999/26S



Shell size		B thread Class 2A 0.1P-0.3L-TS	Q Max (mm)	V thread metric (mm)	Q (F485)* (mm)
MIL-DTL-38999 Series III	Amphenol				
A	9	.6250	21.82	M12x1-6g	21.1
B	11	.7500	24.62	M15x1-6g	23.8
C	13	.8750	28.98	M18x1-6g	28.2
D	15	1.0000	32.16	M22x1-6g	31.4
E	17	1.1875	35.33	M25x1-6g	36.5
F	19	1.2500	38.10	M28x1-6g	39.3
G	21	1.3750	41.28	M31x1-6g	42.5
H	23	1.5000	44.45	M34x1-6g	45.3
J	25	1.6250	47.63	M37x1-6g	48.4

* Conforms to CECC 75.201.002 (coupling nut for arctic gloves)

Notes section with horizontal dotted lines for writing.

STANDARD RANGE

CTV COMPOSITE SHELLS



PRESENTATION

Qualified to MIL- DTL- 38999 standard, the Amphenol composite Tri-Start Connectors offers a lightweight corrosion resistant connector with the same high performance features as its metal counterpart. It also includes the following features:

- Lightweight (20 - 40% weight savings vs. aluminium, 60 - 70% weight savings vs stainless steel)
- High Corrosion resistance
- Durability

Note: Coupling nuts and hexagonal nuts are delivered without plating (black)

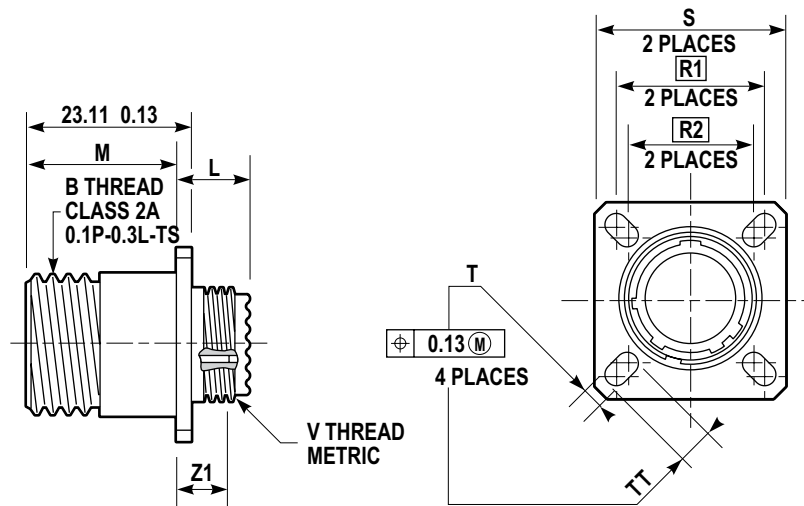
MAIN CHARACTERISTICS

- Shell to shell continuity: Max resistance
 - Class M: 3 mΩ
 - Class J: 3 mΩ
- Durability: - 500 cycles with standards contacts
 - 1500 cycles with "H" type SAE AS39029 pin contacts and "J" type SAE AS39029 socket contacts
- Ozone exposure: MIL-DTL-38999 § 4.5.28 / EIA 364.14.
- Fungus resistance conforms to: MIL-STD-810, method 508.
- EMI shielding effectiveness:
 - 1 GHz: -85 dB (Class M, J)
 - 10 GHz: -65 dB (Class M), -50 dB (Class J)

OVERALL DIMENSIONS - COMPOSITE VERSIONS

SQUARE FLANGE
RECEPTACLE

CTVP00RW JD38999/20J
CTVPS00RF JD38999/20M



Shell size		B	L	M	R1	R2	S	T	Z1	TT	V thread
MIL-DTL-38999 Series III	Amphenol	Thread (inches)	Max (mm)	+0.00 -0.13 (mm)	(mm)	(mm)	±0.25 (mm)	+0.20 -0.13 (mm)	Max (mm)	+0.20 -0.13 (mm)	metric
A	9	.6250	13.055	19.685	18.26	15.09	23.83	3.25	5.03	5.49	M12x1-6g
B	11	.7500	13.055	19.685	20.62	18.26	26.19	3.25	5.03	4.93	M15x1-6g
C	13	.8750	13.055	19.685	23.01	20.62	28.58	3.25	5.03	4.93	M18x1-6g
D	15	1.0000	13.055	19.685	24.61	23.01	30.96	3.25	5.03	4.39	M22x1-6g
E	17	1.1875	13.055	19.685	26.97	24.61	33.32	3.25	5.03	4.93	M25x1-6g
F	19	1.2500	13.055	19.685	29.36	26.97	36.53	3.25	5.03	4.93	M28x1-6g
G	21	1.3750	13.843	18.923	31.75	29.36	39.67	3.25	5.79	4.93	M31x1-6g
H	23	1.5000	13.843	18.923	34.93	31.75	42.88	3.91	5.79	6.15	M34x1-6g
J	25	1.6250	13.843	18.923	38.10	34.93	46.02	3.91	5.79	6.15	M37x1-6g

For panel drilling, see section "Printed Circuit Board Connectors"

For PCB contacts stickout, see section "Printed Circuit Board Connectors"

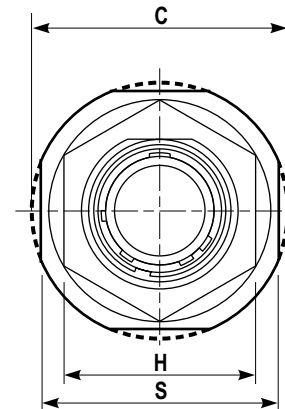
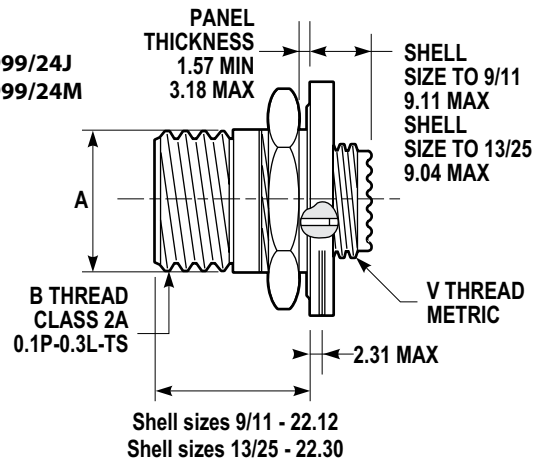
Maximum panel thickness for rear panel mounting: 5,8mm from size 9 to 19
5mm from size 21 to 25

STANDARD RANGE

CTV COMPOSITE SHELLS

JAM NUT
RECEPTACLE

CTV07 RW JD38999/24J
CTVS07 RF JD38999/24M



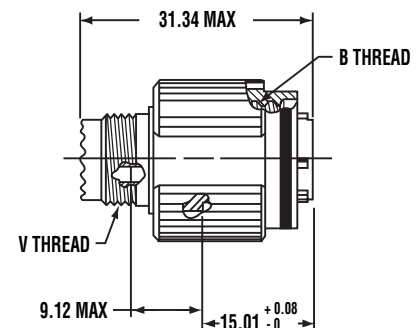
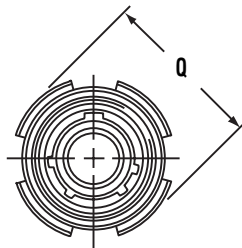
Shell size		A +0.00 -0.25 (mm)	B Thread (inches)	C Max (mm)	H Hex +0.43 -0.41 (mm)	S +0.28 -0.25 (mm)	V thread metric	Hex nut max torque N.m
MIL-DTL-38999 Series III	Amphenol							
A	9	16.99	.6250	30.45	22.23	26.97	M12x1-6g	4.1
B	11	19.53	.7500	35.20	25.40	31.75	M15x1-6g	5.3
C	13	24.26	.8750	38.38	30.17	34.92	M18x1-6g	6.9
D	15	27.53	1.0000	41.55	33.32	38.10	M22x1-6g	8.6
E	17	30.68	1.1875	44.73	36.52	41.28	M25x1-6g	9.8
F	19	33.86	1.2500	49.50	39.67	46.02	M28x1-6g	10.9
G	21	37.06	1.3750	52.65	42.87	49.22	M31x1-6g	12.7
H	23	40.00	1.5000	55.85	46.02	52.37	M34x1-6g	13.8
J	25	43.41	1.6250	59.00	50.80	55.57	M37x1-6g	15

For panel drilling, see section "Printed Circuit Board Connectors"

For PCB contacts stickout, see section "Printed Circuit Board Connectors"

STRAIGHT PLUG

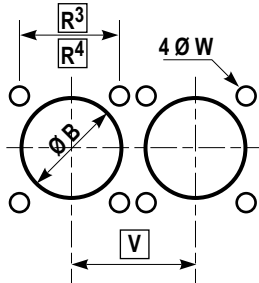
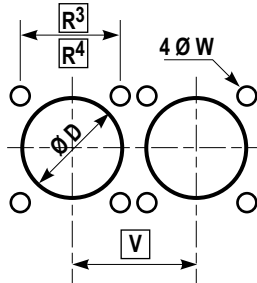
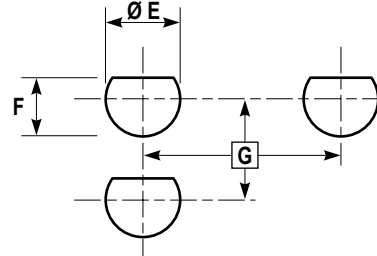
CTV06 RW JD38999/26J
CTVS06 RF JD38999/26M



Shell size		B Thread 0.1P-0.3L-TS-2B (inches)	Q Max (mm)	V thread metric (mm)
MIL-DTL-38999 Series III	Amphenol			
A	9	.6250	21.82	M12x1-6g
B	11	.7500	24.99	M15x1-6g
C	13	.8750	29.39	M18x1-6g
D	15	1.0000	32.49	M22x1-6g
E	17	1.1875	35.69	M25x1-6g
F	19	1.2500	38.48	M28x1-6g
G	21	1.3750	41.68	M31x1-6g
H	23	1.5000	44.88	M34x1-6g
J	25	1.6250	47.98	M37x1-6g

STANDARD RANGE

PANEL DRILLING FOR COMPOSITE AND METALLIC RECEPTACLES

Square flange receptacle
rear panel mountingSquare flange receptacle
front panel mountingJam nut receptacle
rear panel mounting

Shell size		R ³ (mm)	R ⁴ (mm)	V Mini (mm)	Ø B Min (mm)	Ø D Min (mm)	Ø W +0 -0.25 (mm)	G Mini (mm)	Ø E +0.25 0 (mm)	F +0 -0.25 (mm)
MIL-DTL-38999 Series III	Amphenol									
A	9	18.26	15.09	24.60	16.66	13.11	3.25	27.80	17.60	16.70
B	11	20.62	18.26	27.00	20.22	15.88	3.25	32.60	20.96	19.59
C	13	23.01	20.62	30.20	23.42	19.05	3.25	36.00	25.65	24.26
D	15	24.61	23.01	33.30	26.59	23.01	3.25	39.60	28.83	27.56
E	17	26.97	24.61	36.50	30.96	25.81	3.25	43.30	32.01	30.73
F	19	29.36	26.97	39.30	32.94	28.98	3.25	47.00	35.18	33.91
G	21	31.75	29.36	42.50	36.12	32.16	3.25	50.60	38.35	37.08
H	23	34.93	31.75	45.70	39.29	34.93	3.81	54.20	41.53	40.26
J	25	38.10	34.93	48.80	42.47	37.69	3.81	59.70	44.70	43.43

STANDARD RANGE

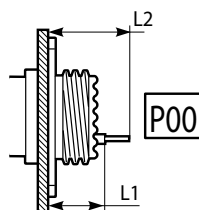
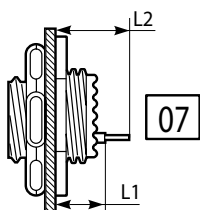
PRINTED CIRCUIT BOARD CONNECTORS

Contacts	Ø A (mm) Minimum hole diameter			
	CI Version		LI Version	
	Gold PCB contacts	Tinned PCB contacts	Gold PCB contacts	Tinned PCB contacts
Size 22D	0.8	0.9	1.0	1.1
Size 20	1.0	1.1	1.0	1.1

STANDARD PCB - TAIL DIMENSIONS AT THE REAR OF RECEPTACLES (IN MM)

			CI Contacts (5 mm tail length)						LI Contacts (8.5 mm tail length)					
			TV 07 - CTV 07		TVP 00		CTVP 00		TV 07 - CTV 07		TVP 00		CTVP 00	
			09 & 11	13 to 25	09 to 19	21 to 25	09 to 19	21 to 25	09 & 11	13 to 25	09 to 19	21 to 25	09 to 19	21 to 25
Pin	L1	min	10.13	9.95	11.55	12.31	12.71	13.47	10.13	9.95	11.55	12.31	12.71	13.47
		Max	11.07	10.89	12.39	13.15	13.52	14.28	11.07	10.89	12.39	13.15	13.52	14.28
	L2	min	15.03	14.85	16.45	17.21	17.61	18.37	18.53	18.35	19.95	20.71	21.11	21.87
		Max	16.17	15.99	17.49	18.25	18.62	19.38	19.67	19.49	20.99	21.75	22.12	22.88
Socket	L1	min	9.93	9.75	11.35	12.11	12.51	13.27	9.93	9.75	11.35	12.11	12.51	13.27
		Max	10.87	10.69	12.19	12.95	13.32	14.08	10.87	10.69	12.19	12.95	13.32	14.08
	L2	min	14.83	14.65	16.25	17.01	17.41	18.17	18.33	18.15	19.75	20.51	20.91	21.67
		Max	15.97	15.79	17.29	18.05	18.42	19.18	19.47	19.29	20.79	21.55	21.92	22.68

For HD38999 inserts, the CI contacts dimensions are valid for pin contacts only. Consult us for socket contacts and pin contact LI version.



STANDARD RANGE

PRINTED CIRCUIT BOARD CONNECTORS

09

Cavity marking	X (mm)	Y (mm)
1	+1.14	+1.98
2	+1.98	-1.14
3	0	-2.29
4	-1.98	-1.14
5	-1.14	+1.98
6	0	0

9-35



6 Contacts Size 22D

Cavity marking	X (mm)	Y (mm)
1	0	+2.67
2	+1.89	+1.89
3	+2.67	0
4	+1.89	-1.89
5	0	-2.67
6	-1.89	-1.89
7	-2.67	0
8	-1.89	+1.89
9	0	0

9-9



9 Contacts Size 23

Cavity marking	X (mm)	Y (mm)
A	+1.65	+0.97
B	0	-1.91
C	-1.65	+0.97

9-98



3 Contacts Size 20

11

Cavity marking	X (mm)	Y (mm)
A	0	0

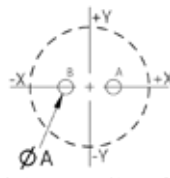
11-12



1 Contacts Size 12

Cavity marking	X (mm)	Y (mm)
A	+2.41	0
B	-2.41	0

11-2



2 Contacts Size 16

Cavity marking	X (mm)	Y (mm)
1	0	+4.08
2	+1.77	+3.06
3	+3.53	+2.04
4	+3.53	0
5	+3.53	-2.04
6	+1.77	-3.06
7	0	-4.08
8	-1.77	-3.06
9	-3.53	-2.04
10	-3.53	0
11	-3.53	+2.04
12	-1.77	+3.06
13	0	+2.04
14	+1.77	+1.02
15	+1.77	-1.02
16	0	-2.04
17	-1.77	-1.02
18	-1.77	+1.02
19	0	0

11-19



19 Contacts Size 23

Cavity marking	X (mm)	Y (mm)
1	0	+3.71
2	+2.16	+3.00
3	+3.51	+1.14
4	+3.51	-1.14
5	+2.16	-3.00
6	0	-3.71
7	-2.16	-3.00
8	-3.51	-1.14
9	-3.51	+1.14
10	-2.16	+3.00
11	0	+1.42
12	+1.24	-0.89
13	-1.24	-0.89

11-35



13 Contacts Size 22D

Cavity marking	X (mm)	Y (mm)
A	+1.65	+1.65
B	+1.65	-1.65
C	-1.65	-1.65
D	-1.65	+1.65

11-4



4 Contacts Size 20

Cavity marking	X (mm)	Y (mm)
A	+1.65	+1.42
B	+2.87	-1.65
C	0	-3.30
D	-2.87	-1.65
E	-1.65	+1.42

11-5



5 Contacts Size 20

Cavity marking	X (mm)	Y (mm)
A	+1.91	+1.91
B	+1.91	-1.91
C	-1.91	-1.91
D	-1.91	+1.91

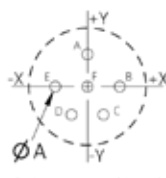
11-54



4 Contacts Size 22D

Cavity marking	X (mm)	Y (mm)
A	0	+3.30
B	+3.30	0
C	+1.65	-2.87
D	-1.65	-2.87
E	-3.30	0
F	0	0

11-98



6 Contacts Size 20

Cavity marking	X (mm)	Y (mm)
A	+1.65	+2.87
B	+3.30	0
C	+1.65	-2.87
D	-1.65	-2.87
E	-3.30	0
F	-1.65	+2.87
G	0	0

11-99



7 Contacts Size 20

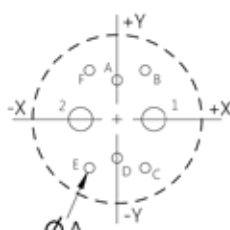
STANDARD RANGE

PRINTED CIRCUIT BOARD CONNECTORS

13

Cavity marking	X (mm)	Y (mm)
A	0	+3.47
B	+2.47	+4.34
C	+2.47	-4.34
D	0	-3.47
E	-2.47	-4.34
F	-2.47	+4.34
1	+3.25	0
2	-3.25	0

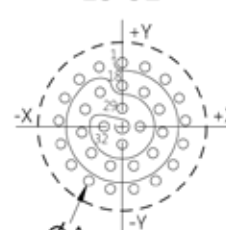
13-26



6 Contacts Size 22D
2 Contacts Size 12

Cavity marking	X (mm)	Y (mm)
1	0	+5.68
2	+2.05	+5.30
3	+3.83	+4.20
4	+5.09	+2.53
5	+5.66	+0.52
6	+5.46	-1.55
7	+4.53	-3.42
8	+2.99	-4.83
9	+1.04	-5.58
10	-1.04	-5.58
11	-2.99	-4.83
12	-4.53	-3.42
13	-5.46	-1.55
14	-5.66	+0.52
15	-5.09	+2.53
16	-3.83	+4.20

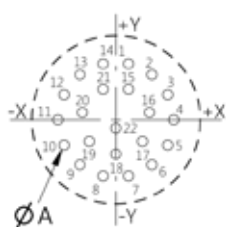
13-32



32 Contacts Size 23

Cavity marking	X (mm)	Y (mm)
1	+1.14	+5.00
2	+3.20	+4.01
3	+4.62	+2.24
4	+5.16	0
5	+4.62	-2.24
6	+3.20	-4.01
7	+1.14	-5.00
8	-1.14	-5.00
9	-3.20	-4.01
10	-4.62	-2.24
11	-5.16	0
12	-4.62	+2.24
13	-3.20	+4.01
14	-1.14	+5.00
15	+1.14	+2.72
16	+2.97	+0.66
17	+2.36	-1.91
18	0	-3.05
19	-2.36	-1.91
20	-2.97	+0.66
21	-1.14	+2.72
22	0	-0.76

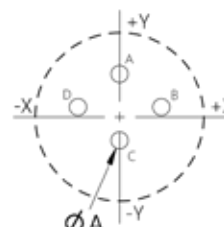
13-35



22 Contacts Size 22D

Cavity marking	X (mm)	Y (mm)
A	0	+3.81
B	+3.71	+0.89
C	0	-2.11
D	-3.71	+0.89

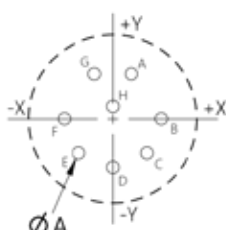
13-4



4 Contacts Size 16

Cavity marking	X (mm)	Y (mm)
A	+1.65	+3.99
B	+4.32	0
C	+3.05	-3.05
D	0	-4.32
E	-3.05	-3.05
F	-4.32	0
G	-1.65	+3.99
H	0	+1.12

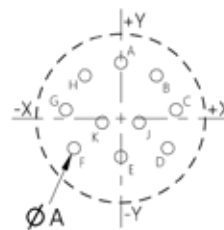
13-8



8 Contacts Size 20

Cavity marking	X (mm)	Y (mm)
A	0	+4.95
B	+3.18	+3.81
C	+4.90	+0.76
D	+4.17	-2.67
E	0	-3.43
F	-4.17	-2.67
G	-4.90	+0.76
H	-3.18	+3.81
J	+1.65	-0.38
K	-1.65	-0.38

13-98



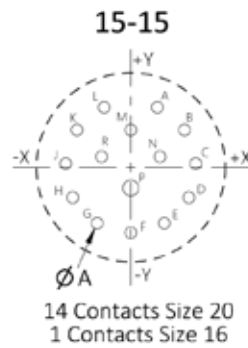
10 Contacts Size 20

STANDARD RANGE

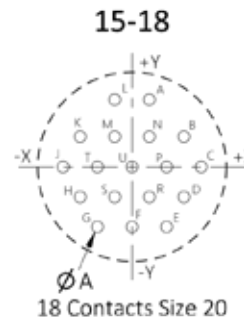
PRINTED CIRCUIT BOARD CONNECTORS

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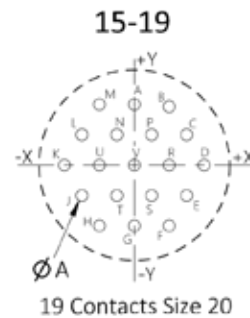
Cavity marking	X (mm)	Y (mm)
A	+2.54	+5.72
B	+5.13	+3.56
C	+6.20	+0.36
D	+5.54	-2.87
E	+3.20	-5.31
F	0	-6.22
G	-3.20	-5.31
H	-5.54	-2.87
J	-6.20	+0.36
K	-5.13	+3.56
L	-2.54	+5.72
M	0	+3.56
N	+2.79	+1.02
P	0	-1.96
R	-2.79	+1.02



Cavity marking	X (mm)	Y (mm)
A	+1.65	+6.40
B	+4.95	+2.87
C	+6.60	0
D	+4.95	-2.87
E	+3.30	-5.72
F	0	-5.72
G	-3.30	-5.72
H	-4.95	-2.87
J	-6.60	0
K	-4.95	+2.87
L	-1.65	+6.40
M	-1.65	+2.87
N	+1.65	+2.87
P	+3.30	0
R	+1.65	-2.87
S	-1.65	-2.87
T	-3.30	0
U	0	0

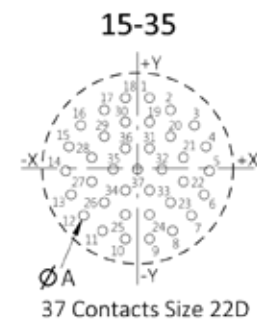


Cavity marking	X (mm)	Y (mm)
A	0	+5.72
B	+3.30	+5.72
C	+4.95	+2.87
D	+6.60	0
E	+4.95	-2.87
F	+3.30	-5.72
G	0	-5.72
H	-3.30	-5.72
J	-4.95	-2.87
K	-6.60	0
L	-4.95	+2.87
M	-3.30	+5.72
N	-1.65	+2.87
P	+1.65	+2.87
R	+3.30	0
S	+1.65	-2.87
T	-1.65	-2.87
U	-3.30	0
V	0	0

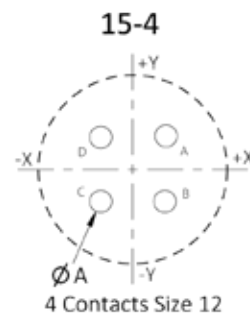


Cavity marking	X (mm)	Y (mm)
1	+1.14	+6.65
2	+3.12	+5.51
3	+5.36	+4.06
4	+6.45	+2.03
5	+6.76	-0.25
6	+6.27	-2.49
7	+5.08	-4.45
8	+3.30	-5.89
9	+1.14	-6.65
10	-1.14	-6.65
11	-3.30	-5.89
12	-5.08	-4.45
13	-6.27	-2.49
14	-6.76	-0.25
15	-6.45	+2.03
16	-5.36	+4.06
17	-3.12	+5.51
18	-1.14	+6.65
19	+1.14	+4.37

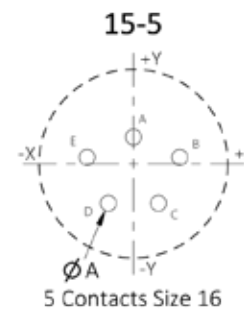
Cavity marking	X (mm)	Y (mm)
20	+3.12	+3.02
21	+4.32	+1.02
22	+4.32	-1.27
23	+3.12	-3.23
24	+1.14	-4.37
25	-1.14	-4.37
26	-3.12	-3.23
27	-4.32	-1.27
28	-4.32	+1.02
29	-3.12	+3.02
30	-1.14	+4.37
31	+1.14	+1.88
32	+2.29	-0.10
33	+1.14	-2.08
34	-1.14	-2.08
35	-2.29	-0.10
36	-1.14	+1.88
37	0	-0.10



Cavity marking	X (mm)	Y (mm)
A	+3.18	+3.18
B	+3.18	-3.18
C	-3.18	-3.18
D	-3.18	+3.18



Cavity marking	X (mm)	Y (mm)
A	0	+2.54
B	+4.42	+0.61
C	+2.39	-3.76
D	-2.39	-3.76
E	-4.42	+0.61



STANDARD RANGE

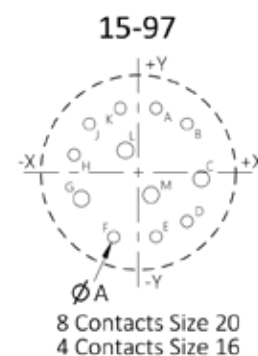
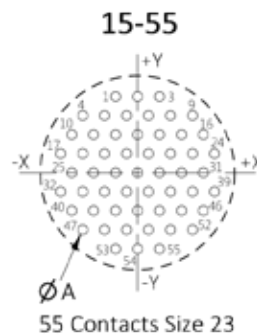
PRINTED CIRCUIT BOARD CONNECTORS

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Cavity marking	X (mm)	Y (mm)
1	-2.04	+7.07
2	0	+7.07
3	+2.04	+7.07
4	-5.10	+5.30
5	-3.06	+5.30
6	-1.02	+5.30
7	+1.02	+5.30
8	+3.06	+5.30
9	+5.10	+5.30
10	-6.12	+3.53
11	-4.08	+3.53
12	-2.04	+3.53
13	0	+3.53
14	+2.04	+3.53
15	+4.08	+3.53
16	+6.12	+3.53
17	-7.14	+1.77
18	-5.10	+1.77
19	-3.06	+1.77

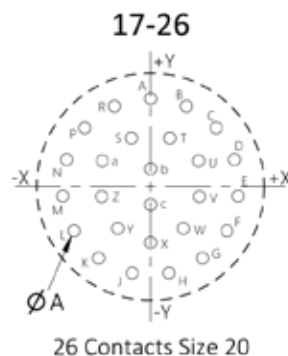
Cavity marking	X (mm)	Y (mm)
20	-1.02	+1.77
21	+1.02	+1.77
22	+3.06	+1.77
23	+5.10	+1.77
24	+7.14	+1.77
25	-6.12	0
26	-4.08	0
27	-2.04	0
28	0	0
29	+2.04	0
30	+4.08	0
31	+6.12	0
32	-7.14	-1.77
33	-5.10	-1.77
34	-3.06	-1.77
35	-1.02	-1.77
36	+1.02	-1.77
37	+3.06	-1.77
38	+5.10	-1.77

Cavity marking	X (mm)	Y (mm)
39	+7.14	-1.77
40	-6.12	-3.53
41	-4.08	-3.53
42	-2.04	-3.53
43	0	-3.53
44	+2.04	-3.53
45	+4.08	-3.53
46	+6.12	-3.53
47	-5.10	-5.30
48	-3.06	-5.30
49	-1.02	-5.30
50	+1.02	-5.30
51	+3.06	-5.30
52	+5.10	-5.30
53	-2.04	-7.07
54	0	-7.07
55	+2.04	-7.07



Cavity marking	X (mm)	Y (mm)
A	+1.65	+5.94
B	+4.52	+4.52
C	+5.84	-0.58
D	+4.52	-4.52
E	+1.65	-5.94
F	-2.26	-5.97
G	-5.26	-2.41
H	-5.94	+1.65
J	-4.52	+4.52
K	-1.65	+5.94
L	-1.19	+2.06
M	+1.19	-2.06

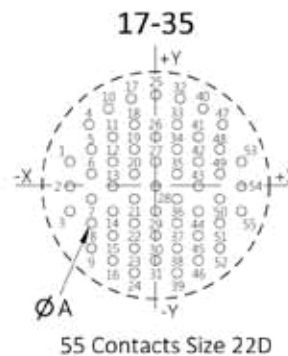
17



Cavity marking	X (mm)	Y (mm)
A	0	+8.15
B	+3.33	+7.44
C	+6.07	+5.44
D	+7.75	+2.51
E	+8.10	-0.86
F	+7.06	-4.09
G	+4.80	-6.60
H	+1.70	-7.98
J	-1.70	-7.98
K	-4.80	-6.60
L	-7.06	-4.09
M	-8.10	-0.86
N	-7.75	+2.51

Cavity marking	X (mm)	Y (mm)
P	-6.07	+5.44
R	-3.33	+7.44
S	-1.78	+4.50
T	+1.78	+4.50
U	+4.45	+2.39
V	+4.52	-0.91
W	+3.02	-3.84
X	0	-5.16
Y	-3.02	-3.84
a	-4.45	+2.39
b	0	+1.65
c	0	-1.65

Cavity marking	X (mm)	Y (mm)
1	-7.92	+2.18
2	-7.92	-0.10
3	-7.92	-2.39
4	-6.15	+5.61
5	-5.94	+3.33
6	-5.94	+1.04
7	-5.94	-1.24
8	-5.94	-3.53
9	-5.94	-5.82
10	-4.37	+7.09
11	-3.96	+4.47
12	-3.96	+2.18
13	-3.96	-0.10
14	-3.96	-2.39
15	-3.96	-4.67
16	-3.96	-6.96
17	-2.26	+8.03
18	-1.98	+5.61
19	-1.98	+3.33



Cavity marking	X (mm)	Y (mm)
20	-1.98	+1.04
21	-1.98	-1.24
22	-1.98	-3.53
23	-1.98	-5.82
24	-1.98	-8.10
25	0	+8.36
26	0	+4.47
27	0	+2.18
28	0	-0.10
29	0	-2.39
30	0	-4.67
31	0	-6.96
32	+2.26	+8.03
33	+1.98	+5.61
34	+1.98	+3.33
35	+1.98	+1.04
36	+1.98	-1.24
37	+1.98	-3.53
38	+1.98	-5.82

Cavity marking	X (mm)	Y (mm)
39	+1.98	-8.10
40	+4.37	+7.09
41	+3.96	+4.47
42	+3.96	+2.18
43	+3.96	-0.10
44	+3.96	-2.39
45	+3.96	-4.67
46	+3.96	-6.96
47	+6.15	+5.61
48	+5.94	+3.33
49	+5.94	+1.04
50	+5.94	-1.24
51	+5.94	-3.53
52	+5.94	-5.82
53	+7.92	+2.18
54	+7.92	-0.10
55	+7.92	-2.39

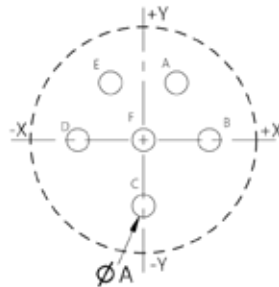
STANDARD RANGE

PRINTED CIRCUIT BOARD CONNECTORS

17

Cavity marking	X (mm)	Y (mm)
A	+3.07	+5.31
B	+6.12	0
C	0	-6.12
D	-6.12	0
E	-3.07	+5.31
F	0	0

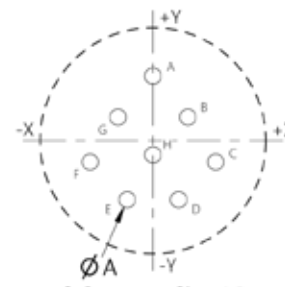
17-6



6 Contacts Size 12

Cavity marking	X (mm)	Y (mm)
A	0	+5.99
B	+3.25	+2.18
C	+5.84	-1.98
D	+2.39	-5.49
E	-2.39	-5.49
F	-5.84	-1.98
G	-3.25	+2.18
H	0	-1.32

17-8



8 Contacts Size 16

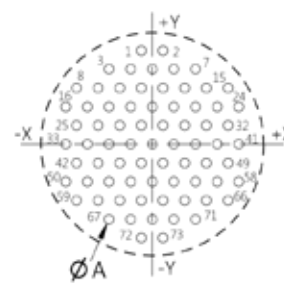
Cavity marking	X (mm)	Y (mm)
1	-1.02	+8.83
2	+1.02	+8.83
3	-4.08	+7.07
4	-2.04	+7.07
5	0	+7.07
6	+2.04	+7.07
7	+4.08	+7.07
8	-7.14	+5.30
9	-5.10	+5.30
10	-3.06	+5.30
11	-1.02	+5.30
12	+1.02	+5.30
13	+3.06	+5.30
14	+5.10	+5.30
15	+7.14	+5.30
16	-8.16	+3.53
17	-6.12	+3.53
18	-4.08	+3.53
19	-2.04	+3.53

Cavity marking	X (mm)	Y (mm)
20	0	+3.53
21	+2.04	+3.53
22	+4.08	+3.53
23	+6.12	+3.53
24	+8.16	+3.53
25	-7.14	+1.77
26	-5.10	+1.77
27	-3.06	+1.77
28	-1.02	+1.77
29	+1.02	+1.77
30	+3.06	+1.77
31	+5.10	+1.77
32	+7.14	+1.77
33	-8.16	0
34	-6.12	0
35	-4.08	0
36	-2.04	0
37	0	0
38	+2.04	0

Cavity marking	X (mm)	Y (mm)
39	+4.08	0
40	+6.12	0
41	+8.16	0
42	-7.14	-1.77
43	-5.10	-1.77
44	-3.06	-1.77
45	-1.02	-1.77
46	+1.02	-1.77
47	+3.06	-1.77
48	+5.10	-1.77
49	+7.14	-1.77
50	-8.16	-3.53
51	-6.12	-3.53
52	-4.08	-3.53
53	-2.04	-3.53
54	0	-3.53
55	+2.04	-3.53
56	+4.08	-3.53
57	+6.12	-3.53

Cavity marking	X (mm)	Y (mm)
58	+8.16	-3.53
59	-7.14	-5.30
60	-5.10	-5.30
61	-3.06	-5.30
62	-1.02	-5.30
63	+1.02	-5.30
64	+3.06	-5.30
65	+5.10	-5.30
66	+7.14	-5.30
67	-4.08	-7.07
68	-2.04	-7.07
69	0	-7.07
70	+2.04	-7.07
71	+4.08	-7.07
72	-1.02	-8.83
73	+1.02	-8.83

17-73

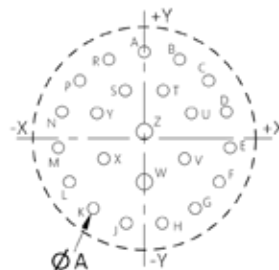


73 Contacts Size 23

Cavity marking	X (mm)	Y (mm)
A	0	+8.15
B	+3.33	+7.44
C	+6.07	+5.44
D	+7.75	+2.51
E	+8.10	-0.86
F	+7.06	-4.09
G	+4.80	-6.60
H	+1.70	-7.98
J	-1.70	-7.98
K	-4.80	-6.60
L	-7.06	-4.09
M	-8.10	-0.86

Cavity marking	X (mm)	Y (mm)
N	-7.75	+2.51
P	-6.07	+5.44
R	-3.33	+7.44
S	-1.78	+4.50
T	+1.78	+4.50
U	+4.45	+2.39
V	+3.81	-1.91
W	0	-4.09
X	-3.81	-1.91
Y	-4.45	+2.39
Z	0	+0.64

17-99

21 Contacts Size 20
2 Contacts Size 16

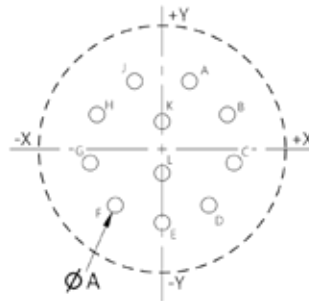
STANDARD RANGE

PRINTED CIRCUIT BOARD CONNECTORS

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Cavity marking	X (mm)	Y (mm)
A	+2.67	+6.60
B	+6.35	+3.35
C	+6.99	-1.35
D	+4.55	-5.46
E	0	-7.14
F	-4.55	-5.46
G	-6.99	-1.35
H	-6.35	+3.35
J	-2.67	+6.60
K	0	+2.67
L	0	-2.34

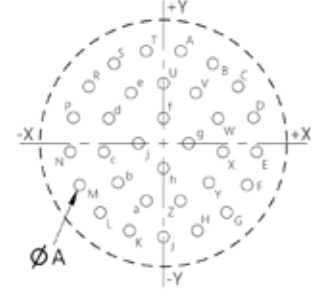
19-11



11 Contacts Size 16

Cavity marking	X (mm)	Y (mm)
A	+1.68	+8.97
B	+4.80	+7.75
C	+7.26	+5.51
D	+8.76	+2.49
E	+9.07	-0.84
F	+8.15	-4.06
G	+6.15	-6.73
H	+3.30	-8.51
J	0	-9.12
K	-3.30	-8.51
L	-6.15	-6.73
M	-8.15	-4.06
N	-9.07	-0.84
P	-8.76	+2.49
R	-7.26	+5.51
S	-4.80	+7.75

19-32



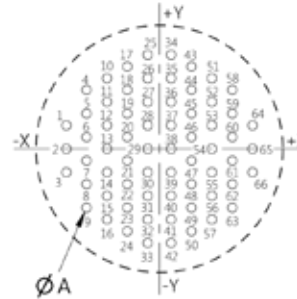
32 Contacts Size 20

Cavity marking	X (mm)	Y (mm)
1	-9.07	+2.29
2	-9.07	0
3	-9.07	-2.29
4	-7.09	+5.72
5	-7.09	+3.43
6	-7.09	+1.14
7	-7.09	-1.14
8	-7.09	-3.43
9	-7.09	-5.72
10	-5.11	+6.86
11	-5.11	+4.57
12	-5.11	+2.29
13	-5.11	0
14	-5.11	-2.29
15	-5.11	-4.57
16	-5.11	-6.86
17	-3.12	+8.00
18	-3.12	+5.72
19	-3.12	+3.43
20	-3.12	+1.14
21	-3.12	-1.14
22	-3.12	-3.43

Cavity marking	X (mm)	Y (mm)
23	-3.12	-5.72
24	-3.12	-8.00
25	-1.14	+9.14
26	-1.14	+6.86
27	-1.14	+4.57
28	-1.14	+2.29
29	-1.14	0
30	-1.14	-2.29
31	-1.14	-4.57
32	-1.14	-6.86
33	-1.14	-9.14
34	+1.14	+9.14
35	+1.14	+6.86
36	+1.14	+4.57
37	+1.14	+2.29
38	+1.14	0
39	+1.14	-2.29
40	+1.14	-4.57
41	+1.14	-6.86
42	+1.14	-9.14
43	+3.12	+8.00
44	+3.12	+5.72

Cavity marking	X (mm)	Y (mm)
45	+3.12	+3.43
46	+3.12	+1.14
47	+3.12	-1.14
48	+3.12	-3.43
49	+3.12	-5.72
50	+3.12	-8.00
51	+5.11	+6.86
52	+5.11	+4.57
53	+5.11	+2.29
54	+5.11	0
55	+5.11	-2.29
56	+5.11	-4.57
57	+5.11	-6.86
58	+7.09	+5.72
59	+7.09	+3.43
60	+7.09	+1.14
61	+7.09	-1.14
62	+7.09	-3.43
63	+7.09	-5.72
64	+9.07	+2.29
65	+9.07	0
66	+9.07	-2.29

19-35



66 Contacts Size 22D

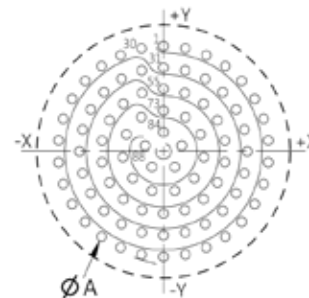
Cavity marking	X (mm)	Y (mm)
1	0	+9.99
2	+2.08	+9.77
3	+4.06	+9.12
4	+5.87	+8.08
5	+7.42	+6.68
6	+8.65	+4.99
7	+9.50	+3.09
8	+9.93	+1.04
9	+9.93	-1.04
10	+9.50	-3.09
11	+8.65	-4.99
12	+7.42	-6.68
13	+5.87	-8.08
14	+4.06	-9.12
15	+2.08	-9.77
16	0	-9.99
17	-2.08	-9.77
18	-4.06	-9.12
19	-5.87	-8.08
20	-7.42	-6.68
21	-8.65	-4.99
22	-9.50	-3.09

Cavity marking	X (mm)	Y (mm)
23	-9.93	-1.04
24	-9.93	+1.04
25	-9.50	+3.09
26	-8.65	+4.99
27	-7.42	+6.68
28	-5.87	+8.08
29	-4.06	+9.12
30	-2.08	+9.77
31	0	+7.95
32	+2.06	+7.67
33	+3.97	+6.88
34	+5.62	+5.62
35	+6.88	+3.97
36	+7.67	+2.06
37	+7.95	0
38	+7.67	-2.06
39	+6.88	-3.97
40	+5.62	-5.62
41	+3.97	-6.88
42	+2.06	-7.67
43	0	-7.95
44	-2.06	-7.67

Cavity marking	X (mm)	Y (mm)
45	-3.97	-6.88
46	-5.62	-5.62
47	-6.88	-3.97
48	-7.67	-2.06
49	-7.95	0
50	-7.67	+2.06
51	-6.88	+3.97
52	-5.62	+5.62
53	-3.97	+6.88
54	-2.06	+7.67
55	0	+5.91
56	+2.02	+5.55
57	+3.80	+4.52
58	+5.11	+2.95
59	+5.82	+1.03
60	+5.82	-1.03
61	+5.11	-2.95
62	+3.80	-4.52
63	+2.02	-5.55
64	0	-5.91
65	-2.02	-5.55
66	-3.80	-4.52

Cavity marking	X (mm)	Y (mm)
67	-5.11	-2.95
68	-5.82	-1.03
69	-5.82	+1.03
70	-5.11	+2.95
71	-3.80	+4.52
72	-2.02	+5.55
73	0	+3.87
74	+2.09	+3.25
75	+3.52	+1.61
76	+3.83	-0.55
77	+2.92	-2.53
78	+1.09	-3.71
79	-1.09	-3.71
80	-2.92	-2.53
81	-3.83	-0.55
82	-3.52	+1.61
83	-2.09	+3.25
84	0	+1.83
85	+1.74	+0.56
86	+1.09	-1.48
87	-1.09	-1.48
88	-1.74	+0.56

19-88



88 Contacts Size 23

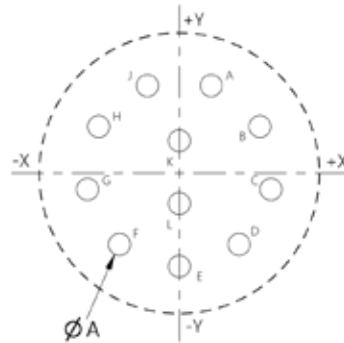
STANDARD RANGE

PRINTED CIRCUIT BOARD CONNECTORS

21

Cavity marking	X (mm)	Y (mm)
A	+3.07	+8.43
B	+7.77	+4.50
C	+8.84	-1.55
D	+5.77	-6.86
E	0	-8.97
F	-5.77	-6.86
G	-8.84	-1.55
H	-7.77	+4.50
J	-3.07	+8.43
K	0	+3.12
L	0	-2.92

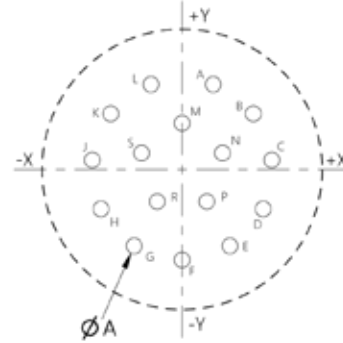
21-11



11 Contacts Size 12

Cavity marking	X (mm)	Y (mm)
A	+3.00	+8.18
B	+6.88	+5.36
C	+8.66	+0.91
D	+7.82	-3.81
E	+4.62	-7.37
F	0	-8.71
G	-4.62	-7.37
H	-7.82	-3.81
J	-8.66	+0.91
K	-6.88	+5.36
L	-3.00	+8.18
M	0	+4.45
N	+3.91	+1.57
P	+2.39	-3.10
R	-2.39	-3.10
S	-3.91	+1.57

21-16

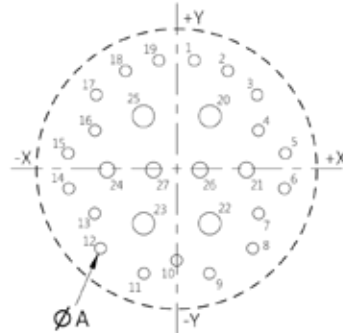


16 Contacts Size 16

Cavity marking	X (mm)	Y (mm)
1	+1.70	+10.46
2	+4.93	+9.45
3	+7.45	+7.14
4	+7.87	+3.71
5	+10.46	+1.52
6	+10.39	-1.88
7	+7.90	-4.29
8	+7.34	-7.67
9	+3.15	-10.08
10	0	-8.81
11	-3.15	-10.08
12	-7.34	-7.67
13	-7.90	-4.29
14	-10.39	-1.88

Cavity marking	X (mm)	Y (mm)
15	-10.46	+1.52
16	-7.87	+3.71
17	-7.45	+7.14
18	-4.93	+9.45
19	-1.70	+10.46
20	+3.20	+5.08
21	+6.71	-0.08
22	+3.18	-5.26
23	-3.18	-5.26
24	-6.71	-0.08
25	-3.20	+5.08
26	+2.24	-0.08
27	-2.24	-0.08

21-29

19 Contacts Size 20
4 Contacts Size 16
4 Contacts Size 12

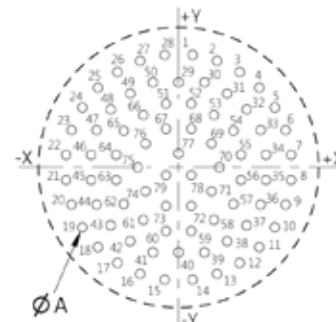
Cavity marking	X (mm)	Y (mm)
1	+1.35	+10.82
2	+3.71	+10.26
3	+5.89	+9.19
4	+7.77	+7.67
5	+9.27	+5.77
6	+10.31	+3.58
7	+10.85	+1.22
8	+10.85	-1.22
9	+10.31	-3.58
10	+9.27	-5.77
11	+7.77	-7.67
12	+5.89	-9.19
13	+3.71	-10.26
14	+1.35	-10.82
15	-1.35	-10.82
16	-3.71	-10.26
17	-5.89	-9.19
18	-7.77	-7.67
19	-9.27	-5.77
20	-10.31	-3.58

Cavity marking	X (mm)	Y (mm)
21	-10.85	-1.22
22	-10.85	+1.22
23	-10.31	+3.58
24	-9.27	+5.77
25	-7.77	+7.67
26	-5.89	+9.19
27	-3.71	+10.26
28	-1.35	+10.82
29	0	+8.20
30	+2.49	+8.18
31	+4.67	+7.11
32	+6.55	+5.59
33	+7.90	+3.58
34	+8.43	+1.22
35	+8.43	-1.22
36	+7.90	-3.58
37	+6.55	-5.59
38	+4.67	-7.11
39	+2.49	-8.18
40	0	-8.81

Cavity marking	X (mm)	Y (mm)
41	-2.49	-8.18
42	-4.67	-7.11
43	-6.55	-5.59
44	-7.90	-3.58
45	-8.43	-1.22
46	-8.43	+1.22
47	-7.90	+3.58
48	-6.55	+5.59
49	-4.67	+7.11
50	-2.49	+8.18
51	-1.22	+6.12
52	+1.22	+6.12
53	+3.40	+5.05
54	+5.28	+3.53
55	+6.02	+1.22
56	+6.02	-1.22
57	+5.28	-3.53
58	+3.40	-5.05
59	+1.22	-6.12
60	-1.22	-6.12

Cavity marking	X (mm)	Y (mm)
61	-3.40	-5.05
62	-5.28	-3.53
63	-6.02	-1.22
64	-6.02	+1.22
65	-5.28	+3.53
66	-3.40	+5.05
67	-1.22	+3.71
68	+1.22	+3.71
69	+3.18	+2.29
70	+3.94	0
71	+3.18	-2.29
72	+1.22	-3.71
73	-1.22	-3.71
74	-3.18	-2.29
75	-3.94	0
76	-3.18	+2.29
77	0	+1.35
78	+1.22	-0.74
79	-1.22	-0.74

21-35



79 Contacts Size 22D

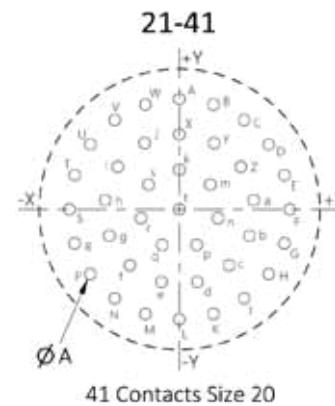
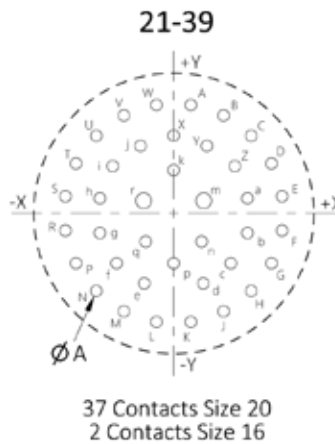
STANDARD RANGE

PRINTED CIRCUIT BOARD CONNECTORS

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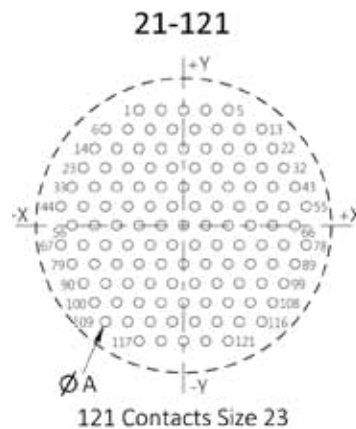
Cavity marking	X (mm)	Y (mm)
A	+1.65	+10.44
B	+4.80	+9.42
C	+7.47	+7.47
D	+9.42	+4.80
E	+10.44	+1.65
F	+10.44	-1.65
G	+9.42	-4.80
H	+7.47	-7.47
J	+4.80	-9.42
K	+1.65	-10.44
L	-1.65	-10.44
M	-4.80	-9.42
N	-7.47	-7.47
P	-9.42	-4.80
R	-10.44	-1.65
S	-10.44	+1.65
T	-9.42	+4.80
U	-7.47	+7.47
V	-4.80	+9.42
W	-1.65	+10.44

Cavity marking	X (mm)	Y (mm)
X	0	+7.49
Y	+3.20	+6.50
Z	+5.89	+4.55
a	+7.11	+1.45
b	+7.11	-1.88
c	+5.51	-4.80
d	+2.84	-6.73
e	-2.84	-6.73
f	-5.51	-4.80
g	-7.11	-1.88
h	-7.11	+1.45
i	-5.89	+4.55
j	-3.20	+6.50
k	0	+4.17
m	+2.90	+1.22
n	+2.69	-2.72
p	0	-4.80
q	-2.69	-2.72
r	-2.90	+1.09



Cavity marking	X (mm)	Y (mm)
A	0	+10.60
B	+3.28	+10.09
C	+6.23	+8.58
D	+8.58	+6.23
E	+10.09	+3.28
F	+10.60	0
G	+10.09	-3.28
H	+8.58	-6.23
J	+6.23	-8.58
K	+3.28	-10.09
L	0	-10.60
M	-3.28	-10.09
N	-6.23	-8.58
P	-8.58	-6.23
R	-10.09	-3.28
S	-10.60	0
T	-10.09	+3.28
U	-8.58	+6.23
V	-6.23	+8.58
W	-3.28	+10.09
X	0	+7.20

Cavity marking	X (mm)	Y (mm)
Y	+3.35	+6.38
Z	+5.92	+4.09
a	+7.15	+0.87
b	+6.73	-2.55
c	+4.78	-5.39
d	+1.73	-6.99
e	-1.73	-6.99
f	-4.78	-5.39
g	-6.73	-2.55
h	-7.15	+0.87
i	-5.92	+4.09
j	-3.35	+6.38
k	0	+3.81
m	+2.98	+2.38
n	+3.71	-0.85
p	+1.66	-3.43
q	-1.66	-3.43
r	-3.71	-0.85
s	-2.98	+2.38
t	0	0



Cavity marking	X (mm)	Y (mm)
1	-4.08	+10.60
2	-2.04	+10.60
3	0	+10.60
4	+2.04	+10.60
5	+4.08	+10.60
6	-7.14	+8.83
7	-5.10	+8.83
8	-3.06	+8.83
9	-1.02	+8.83
10	+1.02	+8.83
11	+3.06	+8.83
12	+5.10	+8.83
13	+7.14	+8.83
14	-8.16	+7.07
15	-6.12	+7.07
16	-4.08	+7.07
17	-2.04	+7.07
18	0	+7.07
19	+2.04	+7.07
20	+4.08	+7.07
21	+6.12	+7.07

Cavity marking	X (mm)	Y (mm)
22	+8.16	+7.07
23	-9.18	+5.30
24	-7.14	+5.30
25	-5.10	+5.30
26	-3.06	+5.30
27	-1.02	+5.30
28	+1.02	+5.30
29	+3.06	+5.30
30	+5.10	+5.30
31	+7.14	+5.30
32	+9.18	+5.30
33	-10.20	+3.53
34	-8.16	+3.53
35	-6.12	+3.53
36	-4.08	+3.53
37	-2.04	+3.53
38	0	+3.53
39	+2.04	+3.53
40	+4.08	+3.53
41	+6.12	+3.53
42	+8.16	+3.53

Cavity marking	X (mm)	Y (mm)
43	+10.20	+3.53
44	-11.22	+1.77
45	-9.18	+1.77
46	-7.14	+1.77
47	-5.10	+1.77
48	-3.06	+1.77
49	-1.02	+1.77
50	+1.02	+1.77
51	+3.06	+1.77
52	+5.10	+1.77
53	+7.14	+1.77
54	+9.18	+1.77
55	+11.22	+1.77
56	-10.20	0
57	-8.16	0
58	-6.12	0
59	-4.08	0
60	-2.04	0
61	0	0
62	+2.04	0
63	+4.08	0

Cavity marking	X (mm)	Y (mm)
64	+6.12	0
65	+8.16	0
66	+10.20	0
67	-11.22	-1.77
68	-9.18	-1.77
69	-7.14	-1.77
70	-5.10	-1.77
71	-3.06	-1.77
72	-1.02	-1.77
73	+1.02	-1.77
74	+3.06	-1.77
75	+5.10	-1.77
76	+7.14	-1.77
77	+9.18	-1.77
78	+11.22	-1.77
79	-10.20	-3.53
80	-8.16	-3.53
81	-6.12	-3.53
82	-4.08	-3.53
83	-2.04	-3.53
84	0	-3.53

Cavity marking	X (mm)	Y (mm)
85	+2.04	-3.53
86	+4.08	-3.53
87	+6.12	-3.53
88	+8.16	-3.53
89	+10.20	-3.53
90	-9.18	-5.30
91	-7.14	-5.30
92	-5.10	-5.30
93	-3.06	-5.30
94	-1.02	-5.30
95	+1.02	-5.30
96	+3.06	-5.30
97	+5.10	-5.30
98	+7.14	-5.30
99	+9.18	-5.30
100	-8.16	-7.07
101	-6.12	-7.07
102	-4.08	-7.07
103	-2.04	-7.07
104	0	-7.07
105	+2.04	-7.07

Cavity marking	X (mm)	Y (mm)
106	+4.08	-7.07
107	+6.12	-7.07
108	+8.16	-7.07
109	-7.14	-8.83
110	-5.10	-8.83
111	-3.06	-8.83
112	-1.02	-8.83
113	+1.02	-8.83
114	+3.06	-8.83
115	+5.10	-8.83
116	+7.14	-8.83
117	-4.08	-10.60
118	-2.04	-10.60
119	0	-10.60
120	+2.04	-10.60
121	+4.08	-10.60

STANDARD RANGE

PRINTED CIRCUIT BOARD CONNECTORS

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Cavity marking	X (mm)	Y (mm)
1	-10.87	+6.12
2	-11.86	+3.91
3	-12.40	+1.55
4	-10.54	0
5	-12.40	-1.55
6	-10.87	-3.61
7	-10.87	-6.02
8	-8.43	+8.46
9	-8.43	+6.05
10	-8.43	+3.63
11	-8.43	+1.22
12	-8.43	-1.19
13	-8.43	-3.61
14	-8.43	-6.02
15	-8.43	-8.43
16	-6.32	+9.65
17	-6.32	+7.24
18	-6.32	+4.83
19	-6.32	+2.41
20	-6.32	0

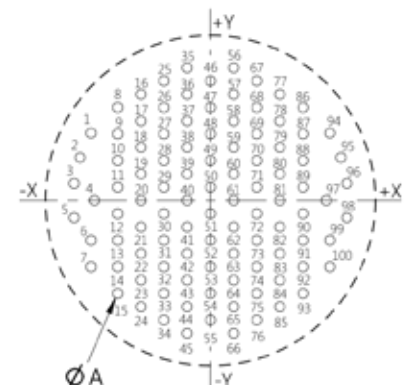
Cavity marking	X (mm)	Y (mm)
21	-6.32	-2.41
22	-6.32	-4.83
23	-6.32	-7.24
24	-6.32	-9.65
25	-4.22	+10.87
26	-4.22	+8.46
27	-4.22	+6.05
28	-4.22	+3.63
29	-4.22	+1.22
30	-4.22	-1.19
31	-4.22	-3.61
32	-4.22	-6.02
33	-4.22	-8.43
34	-4.22	-10.85
35	-2.11	+12.07
36	-2.11	+9.65
37	-2.11	+7.24
38	-2.11	+4.83
39	-2.11	+2.41
40	-2.11	0

Cavity marking	X (mm)	Y (mm)
41	-2.11	-2.41
42	-2.11	-4.83
43	-2.11	-7.24
44	-2.11	-9.65
45	-2.11	-12.07
46	0	+10.87
47	0	+8.46
48	0	+6.05
49	0	+3.63
50	0	+1.22
51	0	-1.19
52	0	-3.61
53	0	-6.02
54	0	-8.43
55	0	-10.85
56	+2.11	+12.07
57	+2.11	+9.65
58	+2.11	+7.24
59	+2.11	+4.83
60	+2.11	+2.41

Cavity marking	X (mm)	Y (mm)
61	+2.11	0
62	+2.11	-2.41
63	+2.11	-4.83
64	+2.11	-7.24
65	+2.11	-9.65
66	+2.11	-12.07
67	+4.22	+10.87
68	+4.22	+8.46
69	+4.22	+6.05
70	+4.22	+3.63
71	+4.22	+1.22
72	+4.22	-1.19
73	+4.22	-3.61
74	+4.22	-6.02
75	+4.22	-8.43
76	+4.22	-10.85
77	+6.32	+9.65
78	+6.32	+7.24
79	+6.32	+4.83
80	+6.32	+2.41

Cavity marking	X (mm)	Y (mm)
81	+6.32	0
82	+6.32	-2.41
83	+6.32	-4.83
84	+6.32	-7.24
85	+6.32	-9.65
86	+8.43	+8.46
87	+8.43	+6.05
88	+8.43	+3.63
89	+8.43	+1.22
90	+8.43	-1.19
91	+8.43	-3.61
92	+8.43	-6.02
93	+8.43	-8.43
94	+10.87	+6.12
95	+11.86	+3.91
96	+12.40	+1.55
97	+10.54	0
98	+12.40	-1.55
99	+10.87	-3.61
100	+10.87	-6.02

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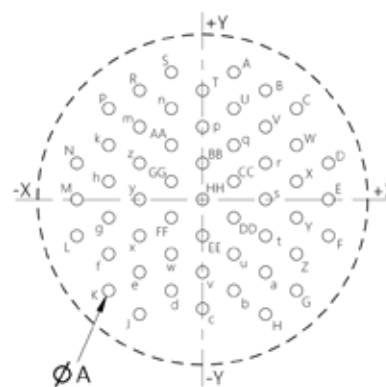
100 Contacts Size 22D

Cavity marking	X (mm)	Y (mm)
A	+2.84	+11.56
B	+5.72	+9.91
C	+8.53	+8.26
D	+11.43	+3.30
E	+11.43	0
F	+11.43	-3.30
G	+8.53	-8.26
H	+5.72	-10.41
J	-5.72	-10.41
K	-8.53	-8.26
L	-11.43	-3.30
M	-11.43	0
N	-11.43	+3.30
P	-8.53	+8.26
R	-5.72	+9.91
S	-2.84	+11.56
T	0	+9.91
U	+2.84	+8.26

Cavity marking	X (mm)	Y (mm)
V	+5.72	+6.60
W	+8.53	+4.95
X	+8.53	+1.65
Y	+8.53	-1.65
Z	+8.53	-4.95
a	+5.72	-6.60
b	+2.84	-8.26
c	0	-9.91
d	-2.84	-8.26
e	-5.72	-6.60
f	-8.53	-4.95
g	-8.53	-1.65
h	-8.53	+1.65
k	-8.53	+4.95
m	-5.72	+6.60
n	-2.84	+8.26
p	0	+6.60
q	+2.84	+4.95

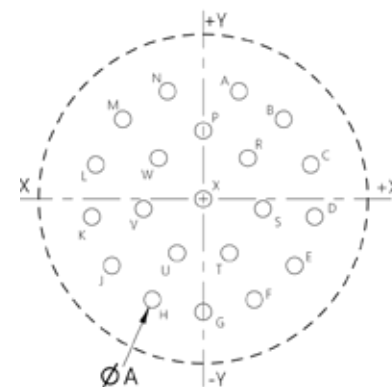
Cavity marking	X (mm)	Y (mm)
r	+5.72	+3.30
s	+5.72	0
t	+5.72	-3.30
u	+2.84	-4.95
v	0	-6.60
w	-2.84	-4.95
x	-5.72	-3.30
y	-5.72	0
z	-5.72	+3.30
AA	-2.84	+4.95
BB	0	+3.30
CC	+2.84	+1.65
DD	+2.84	-1.65
EE	0	-3.30
FF	-2.84	-1.65
GG	-2.84	+1.65
HH	0	0

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53 Contacts Size 20

23-21



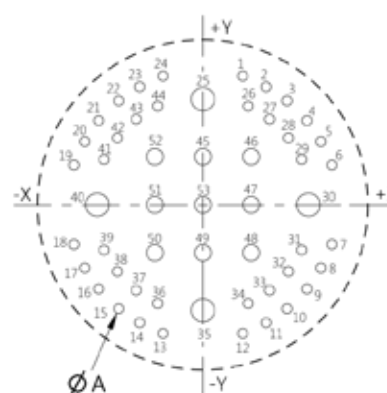
21 Contacts Size 16

Cavity marking	X (mm)	Y (mm)
1	+3.61	+11.71
2	+5.74	+10.72
3	+7.65	+9.45
4	+9.45	+7.65
5	+10.72	+5.74
6	+11.71	+3.61
7	+11.71	-3.61
8	+10.72	-5.74
9	+9.45	-7.65
10	+7.65	-9.45
11	+5.74	-10.72
12	+3.61	-11.71
13	-3.61	-11.71
14	-5.74	-10.72
15	-7.65	-9.45
16	-9.45	-7.65
17	-10.72	-5.74
18	-11.71	-3.61

Cavity marking	X (mm)	Y (mm)
19	-11.71	+3.61
20	-10.72	+5.74
21	-9.45	+7.65
22	-7.65	+9.45
23	-5.74	+10.72
24	-3.61	+11.71
25	0	+9.60
26	+4.11	+8.97
27	+6.07	+7.77
28	+7.77	+6.07
29	+8.97	+4.11
30	+9.60	0
31	+8.97	-4.11
32	+7.77	-6.07
33	+6.07	-7.77
34	+4.11	-8.97
35	0	-9.60
36	-4.11	-8.97

Cavity marking	X (mm)	Y (mm)
37	-6.07	-7.77
38	-7.77	-6.07
39	-8.97	-4.11
40	-9.60	0
41	-8.97	+4.11
42	-7.77	+6.07
43	-6.07	+7.77
44	-4.11	+8.97
45	0	+4.37
46	+4.37	+4.37
47	+4.37	0
48	+4.37	-4.37
49	0	-4.37
50	-4.37	-4.37
51	-4.37	0
52	-4.37	+4.37
53	0	0

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40 Contacts Size 22D
9 Contacts Size 16
4 Contacts Size 12

Cavity marking	X (mm)	Y (mm)
A	+3.25	+9.78
B	+7.34	+7.24
C	+9.80	+3.12
D	+10.16	-1.65
E	+8.33	-6.07
F	+4.65	-9.19
G	0	-10.31
H	-4.65	-9.19
J	-8.33	-6.07
K	-10.16	-1.65
L	-9.80	+3.12
M	-7.34	+7.24
N	-3.25	+9.78
P	0	+6.22
R	+4.06	+3.71
S	+5.44	-0.89
T	+2.39	-4.93
U	-2.39	-4.93
V	-5.44	-0.89
W	-4.06	+3.71
X	0	0

STANDARD RANGE

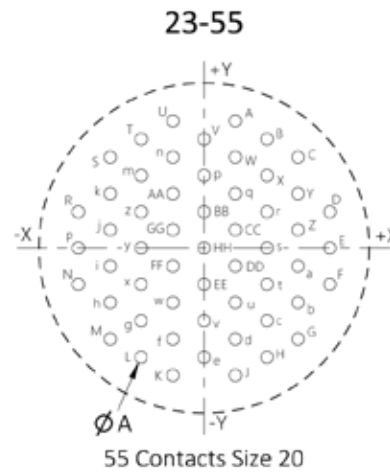
PRINTED CIRCUIT BOARD CONNECTORS

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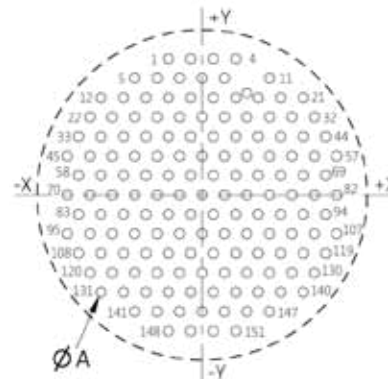
Cavity marking	X (mm)	Y (mm)
A	+2.84	+11.56
B	+5.72	+9.91
C	+8.53	+8.26
D	+11.43	+3.30
E	+11.43	0
F	+11.43	-3.30
G	+8.53	-8.26
H	+5.72	-9.91
J	+2.84	-11.56
K	-2.84	-11.56
L	-5.72	-9.91
M	-8.53	-8.26
N	-11.43	-3.30
P	-11.43	0
R	-11.43	+3.30
S	-8.53	+8.26
T	-5.72	+9.91
U	-2.84	+11.56
V	0	+9.91

Cavity marking	X (mm)	Y (mm)
W	+2.84	+8.26
X	+5.72	+6.60
Y	+8.53	+4.95
Z	+8.53	+1.65
a	+8.53	-1.65
b	+8.53	-4.95
c	+5.72	-6.60
d	+2.84	-8.26
e	0	-9.91
f	-2.84	-8.26
g	-5.72	-6.60
h	-8.53	-4.95
i	-8.53	-1.65
j	-8.53	+1.65
k	-8.53	+4.95
m	-5.72	+6.60
n	-2.84	+8.26
p	0	+6.60
q	+2.84	+4.95

Cavity marking	X (mm)	Y (mm)
r	+5.72	+3.30
s	+5.72	0
t	+5.72	-3.30
u	+2.84	-4.95
v	0	-6.60
w	-2.84	-4.95
x	-5.72	-3.30
y	-5.72	0
z	-5.72	+3.30
AA	-2.84	+4.95
BB	0	+3.30
CC	+2.84	+1.65
DD	+2.84	-1.65
EE	0	-3.30
FF	-2.84	-1.65
GG	-2.84	+1.65
HH	0	0



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Cavity marking	X (mm)	Y (mm)
1	-3.06	+12.37
2	-1.02	+12.37
3	+1.02	+12.37
4	+3.06	+12.37
5	-6.12	+10.60
6	-4.08	+10.60
7	-2.04	+10.60
8	0	+10.60
9	+2.04	+10.60
10	+4.08	+10.60
11	+6.12	+10.60
12	-9.18	+8.83
13	-7.14	+8.83
14	-5.10	+8.83
15	-3.06	+8.83
16	-1.02	+8.83
17	+1.02	+8.83
18	+3.06	+8.83
19	+5.10	+8.83
20	+7.14	+8.83
21	+9.18	+8.83
22	+10.20	+7.07

Cavity marking	X (mm)	Y (mm)
23	-8.16	+7.07
24	-6.12	+7.07
25	-4.08	+7.07
26	-2.04	+7.07
27	0	+7.07
28	+2.04	+7.07
29	+4.08	+7.07
30	+6.12	+7.07
31	+8.16	+7.07
32	+10.20	+7.07
33	-11.22	+5.30
34	-9.18	+5.30
35	-7.14	+5.30
36	-5.10	+5.30
37	-3.06	+5.30
38	-1.02	+5.30
39	+1.02	+5.30
40	+3.06	+5.30
41	+5.10	+5.30
42	+7.14	+5.30
43	+9.18	+5.30
44	+11.22	+5.30

Cavity marking	X (mm)	Y (mm)
45	-12.24	+3.53
46	-10.20	+3.53
47	-8.16	+3.53
48	-6.12	+3.53
49	-4.08	+3.53
50	-2.04	+3.53
51	0	+3.53
52	+2.04	+3.53
53	+4.08	+3.53
54	+6.12	+3.53
55	+8.16	+3.53
56	+10.20	+3.53
57	+12.24	+3.53
58	-11.22	+1.77
59	-9.18	+1.77
60	-7.14	+1.77
61	-5.10	+1.77
62	-3.06	+1.77
63	-1.02	+1.77
64	+1.02	+1.77
65	+3.06	+1.77
66	+5.10	+1.77

Cavity marking	X (mm)	Y (mm)
67	+7.14	+1.77
68	+9.18	+1.77
69	+11.22	+1.77
70	-12.24	0
71	-10.20	0
72	-8.16	0
73	-6.12	0
74	-4.08	0
75	-2.04	0
76	0	0
77	+2.04	0
78	+4.08	0
79	+6.12	0
80	+8.16	0
81	+10.20	0
82	+12.24	0
83	-11.22	-1.77
84	-9.18	-1.77
85	-7.14	-1.77
86	-5.10	-1.77
87	-3.06	-1.77
88	-1.02	-1.77

Cavity marking	X (mm)	Y (mm)
89	+1.02	-1.77
90	+3.06	-1.77
91	+5.10	-1.77
92	+7.14	-1.77
93	+9.18	-1.77
94	+11.22	-1.77
95	-12.24	-3.53
96	-10.20	-3.53
97	-8.16	-3.53
98	-6.12	-3.53
99	-4.08	-3.53
100	-2.04	-3.53
101	0	-3.53
102	+2.04	-3.53
103	+4.08	-3.53
104	+6.12	-3.53
105	+8.16	-3.53
106	+10.20	-3.53
107	+12.24	-3.53
108	-11.22	-5.30
109	-9.18	-5.30
110	-7.14	-5.30

Cavity marking	X (mm)	Y (mm)
111	-5.10	-5.30
112	-3.06	-5.30
113	-1.02	-5.30
114	+1.02	-5.30
115	+3.06	-5.30
116	+5.10	-5.30
117	+7.14	-5.30
118	+9.18	-5.30
119	+11.22	-5.30
120	-10.20	-7.07
121	-8.16	-7.07
122	-6.12	-7.07
123	-4.08	-7.07
124	-2.04	-7.07
125	0	-7.07
126	+2.04	-7.07
127	+4.08	-7.07
128	+6.12	-7.07
129	+8.16	-7.07
130	+10.20	-7.07
131	-9.18	-8.83
132	-7.14	-8.83

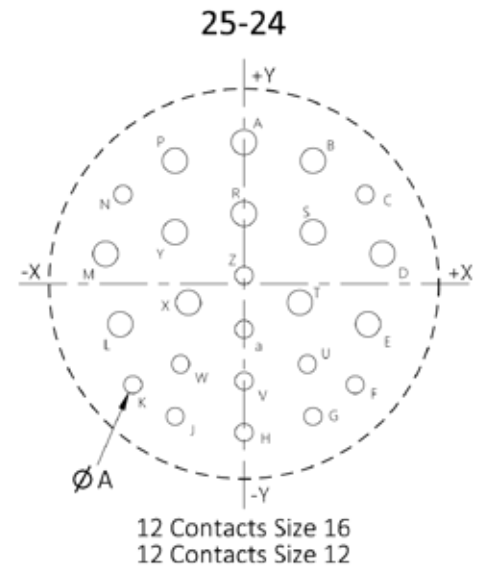
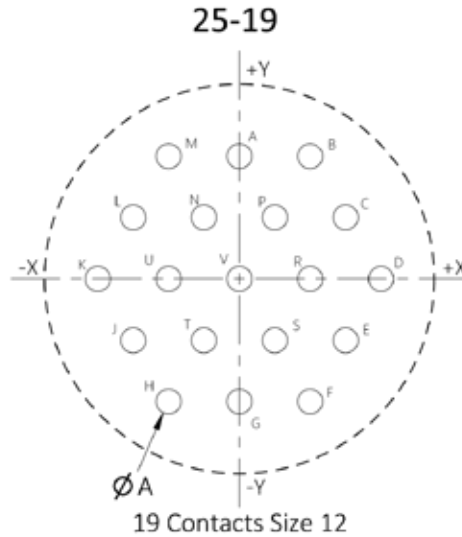
Cavity marking	X (mm)	Y (mm)
133	-5.10	-8.83
134	-3.06	-8.83
135	-1.02	-8.83
136	+1.02	-8.83
137	+3.06	-8.83
138	+5.10	-8.83
139	+7.14	-8.83
140	+9.18	-8.83
141	-6.12	-10.60
142	-4.08	-10.60
143	-2.04	-10.60
144	0	-10.60
145	+2.04	-10.60
146	+4.08	-10.60
147	+6.12	-10.60
148	-3.06	-12.37
149	-1.02	-12.37
150	+1.02	-12.37
151	+3.06	-12.37

STANDARD RANGE

PRINTED CIRCUIT BOARD CONNECTORS

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Cavity marking	X (mm)	Y (mm)
A	0	+10.39
B	+5.99	+10.39
C	+8.99	+5.21
D	+11.99	0
E	+8.99	-5.21
F	+5.99	-10.39
G	0	-10.39
H	-5.99	-10.39
J	-8.99	-5.21
K	-11.99	0
L	-8.99	+5.21
M	-5.99	+10.39
N	-3.00	+5.21
P	+3.00	+5.21
R	+5.99	0
S	+3.00	-5.21
T	-3.00	-5.21
U	-5.99	0
V	0	0

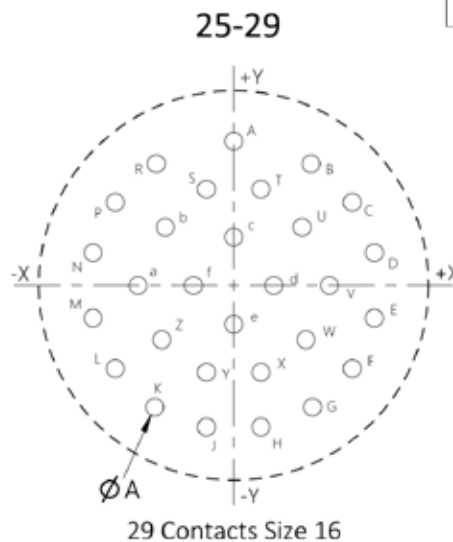


Cavity marking	X (mm)	Y (mm)
A	0	+11.99
B	+5.84	+10.41
C	+10.24	+7.57
D	+11.71	+2.54
E	+10.49	-3.40
F	+9.40	-8.53
G	+5.84	-11.20
H	0	-12.57
J	-5.84	-11.20
K	-9.40	-8.53
L	-10.49	-3.40
M	-11.71	+2.54

Cavity marking	X (mm)	Y (mm)
N	-10.24	+7.57
P	-5.84	+10.41
R	0	+5.94
S	+5.84	+4.37
T	+4.72	-1.57
U	+5.36	-6.78
V	0	-8.20
W	-5.36	-6.78
X	-4.72	-1.57
Y	-5.84	+4.37
Z	0	+0.71
a	0	-3.84

Cavity marking	X (mm)	Y (mm)
A	0	+12.22
B	+6.55	+10.31
C	+10.03	+7.04
D	+11.91	+2.77
E	+11.91	-2.77
F	+10.03	-7.04
G	+6.68	-10.31
H	+2.31	-11.99
J	-2.31	-11.99
K	-6.68	-10.31
L	-10.03	-7.04
M	-11.91	-2.77
N	-11.91	+2.77
P	-10.03	+7.04
R	-6.55	+10.31

Cavity marking	X (mm)	Y (mm)
S	-2.31	+8.15
T	+2.31	+8.15
U	+5.79	+4.93
V	+8.10	0
W	+6.10	-4.60
X	+2.31	-7.37
Y	-2.31	-7.37
Z	-6.10	-4.60
a	-8.10	0
b	-5.79	+4.93
c	0	+4.09
d	+3.40	0
e	0	-3.30
f	-3.40	0

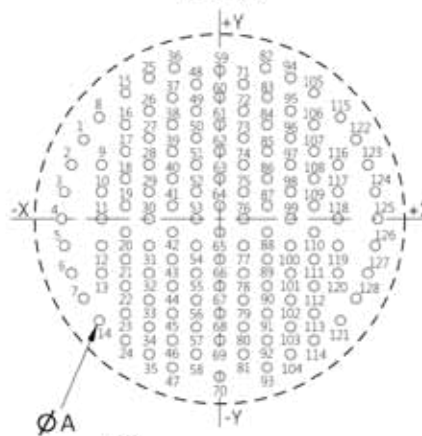


STANDARD RANGE

PRINTED CIRCUIT BOARD CONNECTORS

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128 Contacts Size 22D

Cavity marking	X (mm)	Y (mm)
1	-12.17	+7.09
2	-13.21	+4.83
3	-13.87	+2.41
4	-14.10	0
5	-13.87	-2.41
6	-13.21	-4.83
7	-12.17	-7.09
8	-10.77	+9.07
9	-10.54	+4.83
10	-10.54	+2.41
11	-10.54	0
12	-10.54	-2.41
13	-10.54	-4.83
14	-10.77	-9.07
15	-8.43	+11.28
16	-8.43	+8.43
17	-8.43	+6.02
18	-8.43	+3.61
19	-8.43	+1.19
20	-8.43	-1.19
21	-8.43	-3.61
22	-8.43	-6.02

Cavity marking	X (mm)	Y (mm)
23	-8.43	-8.43
24	-8.43	-10.85
25	-6.32	+12.60
26	-6.32	+9.65
27	-6.32	+7.24
28	-6.32	+4.83
29	-6.32	+2.41
30	-6.32	0
31	-6.32	-2.41
32	-6.32	-4.83
33	-6.32	-7.24
34	-6.32	-9.65
35	-6.32	-12.07
36	-4.06	+13.49
37	-4.22	+10.85
38	-4.22	+8.43
39	-4.22	+6.02
40	-4.22	+3.61
41	-4.22	+1.19
42	-4.22	-1.19
43	-4.22	-3.61
44	-4.22	-6.02

Cavity marking	X (mm)	Y (mm)
45	-4.22	-8.43
46	-4.22	-10.85
47	-4.22	-13.26
48	-2.11	+12.07
49	-2.11	+9.65
50	-2.11	+7.24
51	-2.11	+4.83
52	-2.11	+2.41
53	-2.11	0
54	-2.11	-2.41
55	-2.11	-4.83
56	-2.11	-7.24
57	-2.11	-9.65
58	-2.11	-12.07
59	0	+13.26
60	0	+10.85
61	0	+8.43
62	0	+6.02
63	0	+3.61
64	0	+1.19
65	0	-1.19
66	0	-3.61

Cavity marking	X (mm)	Y (mm)
67	0	-6.02
68	0	-8.43
69	0	-10.85
70	0	-14.10
71	+2.11	+12.07
72	+2.11	+9.65
73	+2.11	+7.24
74	+2.11	+4.83
75	+2.11	+2.41
76	+2.11	0
77	+2.11	-2.41
78	+2.11	-4.83
79	+2.11	-7.24
80	+2.11	-9.65
81	+2.11	-12.07
82	+4.06	+13.49
83	+4.22	+10.85
84	+4.22	+8.43
85	+4.22	+6.02
86	+4.22	+3.61
87	+4.22	+1.19
88	+4.22	-1.19

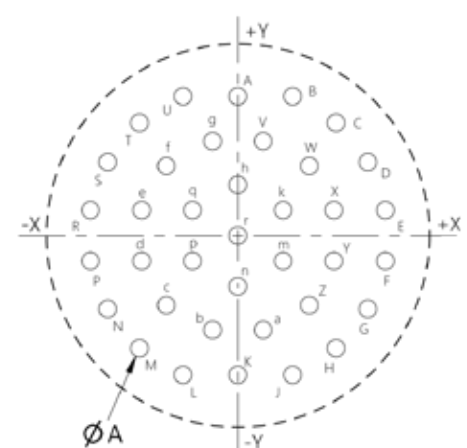
Cavity marking	X (mm)	Y (mm)
89	+4.22	-3.61
90	+4.22	-6.02
91	+4.22	-8.43
92	+4.22	-10.85
93	+4.22	-13.26
94	+6.32	+12.60
95	+6.32	+9.65
96	+6.32	+7.24
97	+6.32	+4.83
98	+6.32	+2.41
99	+6.32	0
100	+6.32	-2.41
101	+6.32	-4.83
102	+6.32	-7.24
103	+6.32	-9.65
104	+6.32	-12.07
105	+8.43	+11.28
106	+8.43	+8.43
107	+8.43	+6.02
108	+8.43	+3.61
109	+8.43	+1.19
110	+8.43	-1.19

Cavity marking	X (mm)	Y (mm)
111	+8.43	-3.61
112	+8.43	-6.02
113	+8.43	-8.43
114	+8.43	-10.85
115	+10.77	+9.07
116	+10.54	+4.83
117	+10.54	+2.41
118	+10.54	0
119	+10.54	-2.41
120	+10.54	-4.83
121	+10.77	-9.07
122	+12.17	+7.09
123	+13.21	+4.83
124	+13.87	+2.41
125	+14.10	0
126	+13.87	-2.41
127	+13.21	-4.83
128	+12.17	-7.09

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Cavity marking	X (mm)	Y (mm)
A	0	+11.99
B	+4.70	+11.99
C	+8.46	+9.70
D	+11.20	+6.32
E	+12.70	+2.18
F	+12.70	-2.18
G	+11.20	-6.32
H	+8.46	+9.70
J	+4.72	-11.99
K	0	-11.99
L	-4.72	-11.99
M	-8.46	-9.70
N	-11.20	-6.32
P	-12.70	-2.18
R	-12.70	+2.18
S	-11.20	+6.32
T	-8.46	+9.70
U	-4.72	+11.99
V	+2.18	+8.13

Cavity marking	X (mm)	Y (mm)
W	+6.15	+5.99
X	+8.28	+2.18
Y	+8.28	-2.18
Z	+6.15	-5.99
a	+2.18	-8.13
b	-2.18	-8.13
c	-6.15	-5.99
d	-8.28	-2.18
e	-8.28	+2.18
f	-6.15	+5.99
g	-2.18	+8.13
h	0	+4.37
k	+3.91	+2.18
m	+3.91	-2.18
n	0	-4.37
p	-3.91	-2.18
q	-3.91	+2.18
r	0	0



37 Contacts Size 16

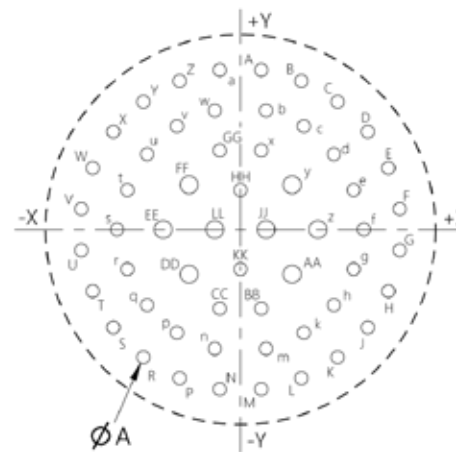
STANDARD RANGE

PRINTED CIRCUIT BOARD CONNECTORS

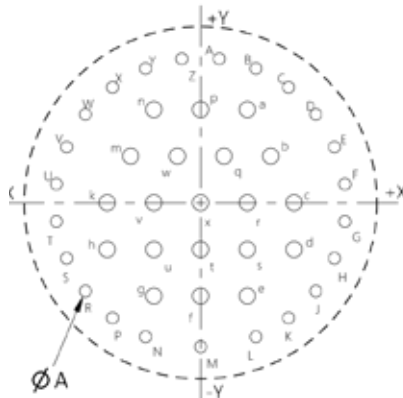
25

Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)
A	+1.75	+13.49	W	-12.52	+5.21	t	-9.58	+3.35
B	+5.16	+12.57	X	-10.77	+8.28	u	-7.90	+6.38
C	+8.23	+10.80	Y	-8.23	+10.80	v	-5.38	+8.74
D	+10.77	+8.28	Z	-5.16	+12.57	w	-2.18	+10.08
E	+12.52	+5.21	a	-1.75	+13.49	x	+1.75	+6.68
F	+13.49	+1.75	b	+2.18	+10.08	y	+4.37	+3.78
G	+13.49	-1.75	c	+5.38	+8.74	z	+6.55	0
H	+12.52	-5.21	d	+7.90	+6.38	AA	+4.37	-3.78
J	+10.77	-8.28	e	+9.58	+3.35	BB	+1.75	-6.68
K	+8.23	-10.80	f	+10.46	0	CC	-1.75	-6.68
L	+5.16	-12.57	g	+9.58	-3.35	DD	-4.37	-3.78
M	+1.75	-13.49	h	+7.90	-6.38	EE	-6.55	0
N	-1.75	-13.49	k	+5.38	-8.74	FF	-4.37	+3.78
P	-5.16	-12.57	m	+2.18	-10.08	GG	-1.75	+6.68
R	-8.23	-10.80	n	-2.18	-10.08	HH	0	+3.35
S	-10.77	-8.28	p	-5.38	-8.74	JJ	+2.18	0
T	-12.52	-5.21	q	-7.90	-6.38	KK	0	-3.35
U	-13.49	-1.75	r	-9.58	-3.35	LL	-2.18	0
V	-13.49	+1.75	s	-10.46	0			

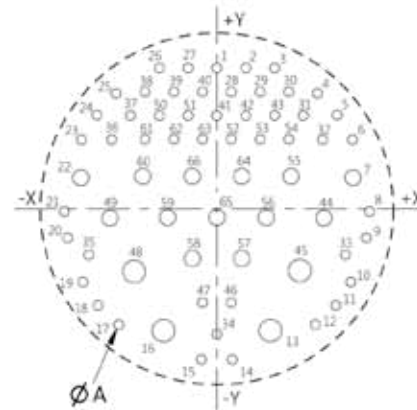
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48 Contacts Size 20
8 Contacts Size 16

25-43

23 Contacts Size 20
20 Contacts Size 16

25-F4

49 Contacts Size 22D
13 Contacts Size 16
4 Contacts Size 12

Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)
A	+1.75	+13.49	Z	-1.75	+13.49
B	+5.16	+12.57	a	+4.37	+8.74
C	+8.23	+10.80	b	+6.55	+4.37
D	+10.77	+8.28	c	+8.74	0
E	+12.52	+5.21	d	+8.74	-4.37
F	+13.49	+1.75	e	+4.37	-8.74
G	+13.49	-1.75	f	0	-8.74
H	+12.52	-5.21	g	-4.37	-8.74
J	+10.77	-8.28	h	-8.74	-4.37
K	+8.23	-10.80	k	-8.74	0
L	+5.16	-12.57	m	-6.55	+4.37
M	0	-13.49	n	-4.37	+8.74
N	-5.16	-12.57	p	0	+8.74
P	-8.23	-10.80	q	+2.18	+4.37
R	-10.77	-8.28	r	+4.37	0
S	-12.52	-5.21	s	+4.37	-4.37
T	-13.49	-1.75	t	0	-4.37
U	-13.49	+1.75	u	-4.37	-4.37
V	-12.52	+5.21	v	-4.37	0
W	-10.77	+8.28	w	-2.18	+4.37
X	-8.23	+10.80	x	0	0
Y	-5.16	+12.57			

Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)
1	0	+13.18	23	-12.67	+6.48	45	+7.75	-5.89
2	+2.69	+13.18	24	-11.23	+8.79	46	+1.35	-8.81
3	+5.38	+13.18	25	-9.42	+10.82	47	-1.35	-8.81
4	+9.42	+10.82	26	-5.38	+13.18	48	-7.75	-5.89
5	+11.23	+8.79	27	-2.69	+13.18	49	-10.01	-0.86
6	+12.67	+6.48	28	+1.35	+10.97	50	-5.38	+8.74
7	+12.73	+2.92	29	+4.04	+10.97	51	-2.69	+8.74
8	+14.27	-0.25	30	+6.73	+10.97	52	+1.35	+6.53
9	+13.97	-2.72	31	+8.08	+8.74	53	+4.04	+6.53
10	+12.52	-6.86	32	+9.86	+6.48	54	+6.73	+6.53
11	+11.10	-9.07	33	+11.99	-4.32	55	+6.93	+3.05
12	+9.19	-10.87	34	0	-11.79	56	+4.62	-0.81
13	+5.00	-11.43	35	-11.99	-4.32	57	+2.31	-4.67
14	+1.45	-14.15	36	-9.86	+6.48	58	-2.31	-4.67
15	-1.45	-14.15	37	-8.08	+8.74	59	-4.62	-0.81
16	-5.00	-11.43	38	-6.73	+10.97	60	-6.93	+3.05
17	-9.19	-10.87	39	-4.04	+10.97	61	-6.73	+6.53
18	-11.10	-9.07	40	-1.35	+10.97	62	-4.04	+6.53
19	-12.52	-6.86	41	0	+8.74	63	-1.35	+6.53
20	-13.97	-2.72	42	+2.69	+8.74	64	+2.31	+3.05
21	-14.27	-0.25	43	+5.38	+8.74	65	0	-0.81
22	-12.73	+2.92	44	+10.01	-0.86	66	-2.31	+3.05

STANDARD RANGE

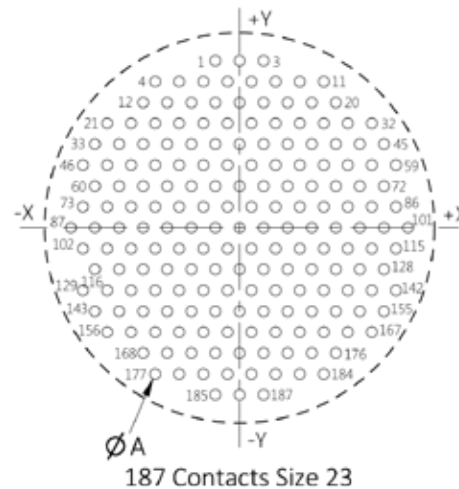
PRINTED CIRCUIT BOARD CONNECTORS

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Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)
1	-2.04	+14.13	22	-9.18	+8.83	43	+8.16	+7.07	64	-4.08	+3.53	85	+11.22	+1.77	106	-5.10	-1.77
2	0	+14.13	23	-7.14	+8.83	44	+10.20	+7.07	65	-2.04	+3.53	86	+13.26	+1.77	107	-3.06	-1.77
3	+2.04	+14.13	24	-5.10	+8.83	45	+12.24	+7.07	66	0	+3.53	87	-14.28	0	108	-1.02	-1.77
4	-7.14	+12.37	25	-3.06	+8.83	46	-13.26	+5.30	67	+2.04	+3.53	88	-12.24	0	109	+1.02	-1.77
5	-5.10	+12.37	26	-1.02	+8.83	47	-11.22	+5.30	68	+4.08	+3.53	89	-10.20	0	110	+3.06	-1.77
6	-3.06	+12.37	27	+1.02	+8.83	48	-9.18	+5.30	69	+6.12	+3.53	90	-8.16	0	111	+5.10	-1.77
7	-1.02	+12.37	28	+3.06	+8.83	49	-7.14	+5.30	70	+8.16	+3.53	91	-6.12	0	112	+7.14	-1.77
8	+1.02	+12.37	29	+5.10	+8.83	50	-5.10	+5.30	71	+10.20	+3.53	92	-4.08	0	113	+9.18	-1.77
9	+3.06	+12.37	30	+7.14	+8.83	51	-3.06	+5.30	72	+12.24	+3.53	93	-2.04	0	114	+11.22	-1.77
10	+5.10	+12.37	31	+9.18	+8.83	52	-1.02	+5.30	73	-13.26	+1.77	94	0	0	115	+13.26	-1.77
11	+7.14	+12.37	32	+11.22	+8.83	53	+1.02	+5.30	74	-11.22	+1.77	95	+2.04	0	116	-12.24	-3.53
12	-8.16	+10.60	33	-12.24	+7.07	54	+3.06	+5.30	75	-9.18	+1.77	96	+4.08	0	117	-10.20	-3.53
13	-6.12	+10.60	34	-10.20	+7.07	55	+5.10	+5.30	76	-7.14	+1.77	97	+6.12	0	118	-8.16	-3.53
14	-4.08	+10.60	35	-8.16	+7.07	56	+7.14	+5.30	77	-5.10	+1.77	98	+8.16	0	119	-6.12	-3.53
15	-2.04	+10.60	36	-6.12	+7.07	57	+9.18	+5.30	78	-3.06	+1.77	99	+10.20	0	120	-4.08	-3.53
16	0	+10.60	37	-4.08	+7.07	58	+11.22	+5.30	79	-1.02	+1.77	100	+12.24	0	121	-2.04	-3.53
17	+2.04	+10.60	38	-2.04	+7.07	59	+13.26	+5.30	80	+1.02	+1.77	101	+14.28	0	122	0	-3.53
18	+4.08	+10.60	39	0	+7.07	60	-12.24	+3.53	81	+3.06	+1.77	102	-13.26	-1.77	123	+2.04	-3.53
19	+6.12	+10.60	40	+2.04	+7.07	61	-10.20	+3.53	82	+5.10	+1.77	103	-11.22	-1.77	124	+4.08	-3.53
20	+8.16	+10.60	41	+4.08	+7.07	62	-8.16	+3.53	83	+7.14	+1.77	104	-9.18	-1.77	125	+6.12	-3.53
21	-11.22	+8.83	42	+6.12	+7.07	63	-6.12	+3.53	84	+9.18	+1.77	105	-7.14	-1.77	126	+8.16	-3.53

Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)	Cavity marking	X (mm)	Y (mm)
127	+10.20	-3.53	148	-2.04	-7.07	169	-6.12	-10.60
128	+12.24	-3.53	149	0	-7.07	170	-4.08	-10.60
129	-13.26	-5.30	150	+2.04	-7.07	171	-2.04	-10.60
130	-11.22	-5.30	151	+4.08	-7.07	172	0	-10.60
131	-9.18	-5.30	152	+6.12	-7.07	173	+2.04	-10.60
132	-7.14	-5.30	153	+8.16	-7.07	174	+4.08	-10.60
133	-5.10	-5.30	154	+10.20	-7.07	175	+6.12	-10.60
134	-3.06	-5.30	155	+12.24	-7.07	176	+8.16	-10.60
135	-1.02	-5.30	156	-11.22	-8.83	177	-7.14	-12.37
136	+1.02	-5.30	157	-9.18	-8.83	178	-5.10	-12.37
137	+3.06	-5.30	158	-7.14	-8.83	179	-3.06	-12.37
138	+5.10	-5.30	159	-5.10	-8.83	180	-1.02	-12.37
139	+7.14	-5.30	160	-3.06	-8.83	181	+1.02	-12.37
140	+9.18	-5.30	161	-1.02	-8.83	182	+3.06	-12.37
141	+11.22	-5.30	162	+1.02	-8.83	183	+5.10	-12.37
142	+13.26	-5.30	163	+3.06	-8.83	184	+7.14	-12.37
143	-12.24	-7.07	164	+5.10	-8.83	185	-2.04	-14.13
144	-10.20	-7.07	165	+7.14	-8.83	186	0	-14.13
145	-8.16	-7.07	166	+9.18	-8.83	187	+2.04	-14.13
146	-6.12	-7.07	167	+11.22	-8.83			
147	-4.08	-7.07	168	-8.16	-10.60			

25-187



STANDARD RANGE

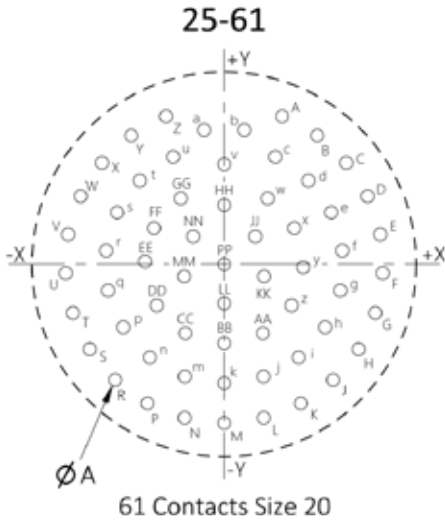
PRINTED CIRCUIT BOARD CONNECTORS

25

Cavity marking	X (mm)	Y (mm)
A	+4.98	+12.70
B	+7.98	+11.05
C	+10.49	+8.71
D	+12.32	+5.84
E	+13.39	+2.57
F	+13.61	-0.76
G	+12.98	-4.17
H	+11.53	-7.29
J	+9.35	-9.93
K	+6.58	-11.94
L	+3.40	-13.18
M	0	-13.64
N	-3.40	-13.18
P	-6.58	-11.94
R	-9.35	-9.93
S	-11.53	-7.29
T	-12.98	-4.17
U	-13.61	-0.76
V	-13.39	+2.57
W	-12.32	+5.84
X	-10.49	+8.71

Cavity marking	X (mm)	Y (mm)
Y	-7.98	+11.05
Z	-4.98	+12.70
a	-1.73	+11.53
b	+1.73	+11.53
c	+4.39	+9.22
d	+7.24	+7.19
e	+9.19	+4.45
f	+10.13	+1.17
g	+9.96	-2.24
h	+8.66	-5.41
i	+6.38	-7.98
j	+3.38	-9.63
k	0	-10.21
m	-3.38	-9.63
n	-6.38	-7.98
p	-8.66	-5.41
q	-9.96	-2.24
r	-10.13	+1.17
s	-9.19	+4.45
t	-7.24	+7.19
u	-4.39	+9.22

Cavity marking	X (mm)	Y (mm)
v	0	+8.59
w	+3.73	+5.66
x	+6.02	+3.10
y	+6.78	-0.25
z	+5.79	-3.53
AA	+3.33	-5.92
BB	0	-6.78
CC	-3.33	-5.92
DD	-5.79	-3.53
EE	-6.78	-0.25
FF	-6.02	+3.10
GG	-3.73	+5.66
HH	0	+5.08
JJ	+2.67	+2.39
KK	+3.43	-1.04
LL	0	-3.35
MM	-3.43	-1.04
NN	-2.67	+2.39
PP	0	0



Handwriting practice lines consisting of 20 horizontal dotted lines.

EXTENDED RANGE

REDUCED FLANGE

NEW

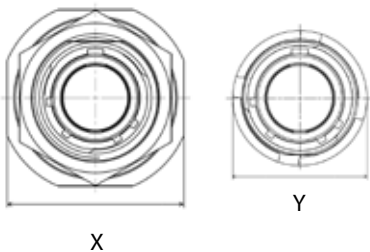


MAIN CHARACTERISTICS

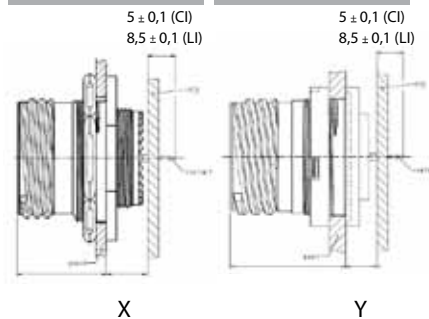
- More density on panel 37% average footprint surface reduction
- More space inside the box: 36% average reduction of panel/PCB distance
- Lighter: 30% average lighter than standard 38999 stand off receptacle
- Derivated from MIL-DTL-38999 series III version
- Mates with standard MIL-DTL-38999 series III plugs and caps
- Reduced flange receptacles are available in crimp version, with PC Tail contacts, as well as in stand off version
- For jam nut (TV07) configurations

SMALLER DIMENSIONS

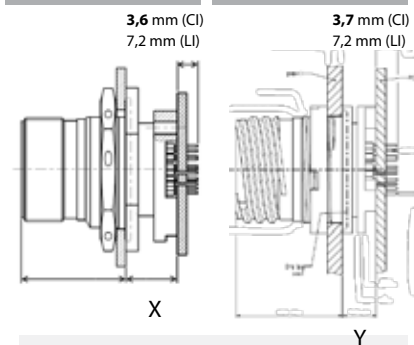
Crimp Contacts

38999 Series III
Standard38999 Series III
Reduced Flange

PC Tail Contacts

38999 Series III
PC Tail38999 Series III
Reduced Flange
PC Tail

PC Tail Contacts & Stand Off

38999 Series III
Stand Off38999 Series III
Reduced Flange
Stand Off► Deviation: **F312/F311*** with safety castel nut► Deviation: **F059/F058*** with safety castel nut* with safety
castel nut

FOOTPRINT AND WEIGHT SAVING

Sizes	Footprint Reduction (mm²)
9	43%
11	46%
13	43%
15	36%
17	26%
19	37%
21	36%
23	34%
25	30%

Example of **Weight Reduction** :

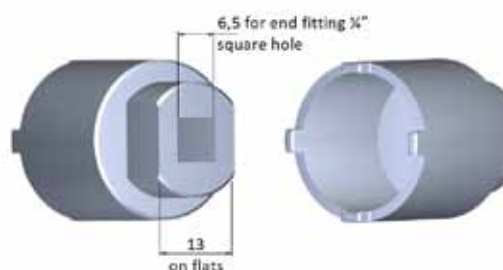
38999 Series III stand off version: TV07WCI13-35P F459 = 31.46 g

38999 Series III Reduced flange stand off version : TV07WCI13-35P F259 = 19.49 g

> The #13 Reduced flange stand off version is **38 % lighter** than 38999 Series III standard stand off version.

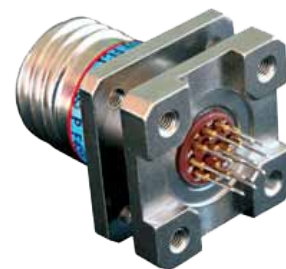
TOOLS

Sizes	Tools PN
9	809681
11	809682
13	809683
15	809684
17	809685
19	809686
21	809687
23	809688
25	809689



EXTENDED RANGE

STAND OFF RECEPTACLES



MAIN CHARACTERISTICS

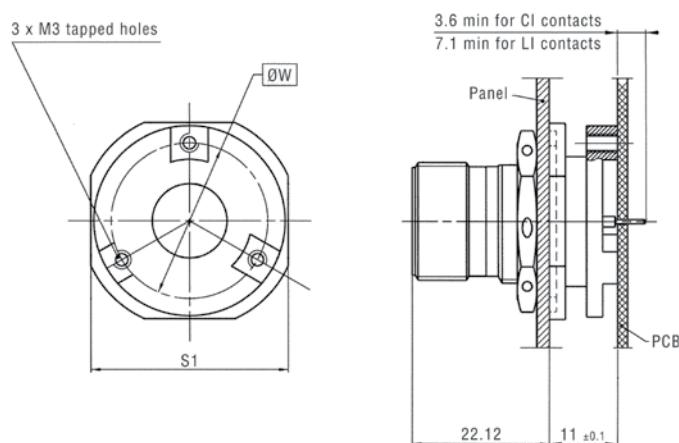
- Receptacles with stand-off flange shells, for attachment to printed circuit boards.
- Tin plated contacts. Lead free versions available.
- Available in wall mount (TVP00) and jam nut (TV07) configurations.
- Prevent any mechanical stress on the contact tails.
- Provide grounding continuity between PCB and box.
- Increase reliability and resistance to shocks and vibrations
- For composite versions, please consult us.

Deviations :

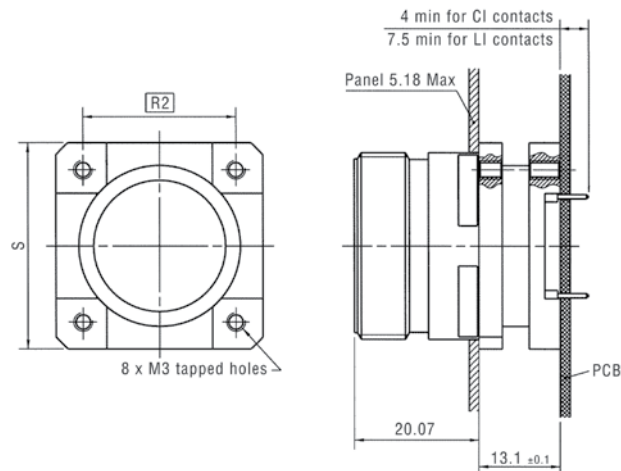
- Lead Tinned Stand Off : F459
 - Silver Tinned Stand Off : F459LF
 - Silver Copper Tinned Stand Off : F459LFC
- For other versions, please consult us*

OVERALL DIMENSIONS

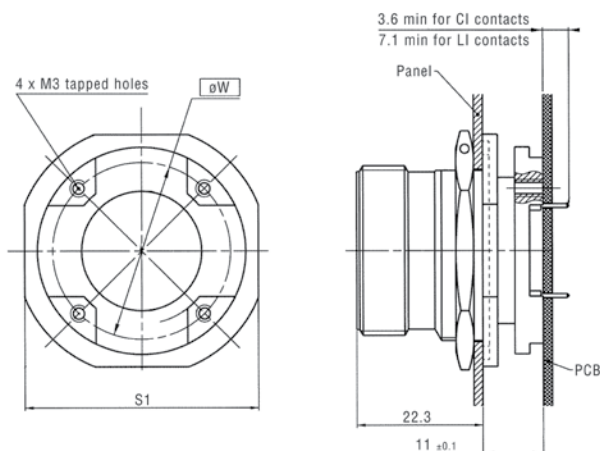
Jam nut receptacle (size 9 and 11)



Square flange receptacle (size 9 to 25)



Jam nut receptacle (size 13 to 25)



Shell Size	$S \pm 0.25$ (mm)	$R2$ (mm)	$S1 \pm 0.4$ (mm)	ϕW (mm)
9	23.83	16.00	27.0	20.50
11	26.19	18.26	31.8	25.20
13	28.58	20.62	34.9	25.25
15	30.96	23.01	38.1	28.42
17	33.32	26.10	41.3	31.42
19	36.53	27.24	46.0	35.03
21	39.67	29.36	49.2	37.82
23	42.88	31.75	52.4	41.12
25	46.02	34.93	55.6	44.30

Contact us for more detailed information.

For ordering informations, see section "Printed Circuit Board Connectors"

EXTENDED RANGE

TVS-Y / TVS-YN HERMETIC RECEPTACLES

PRESENTATION

TVS-Y and TVS-YN hermetic receptacles are dedicated to applications requiring low air leakage or high protection facing to contamination.



MAIN CHARACTERISTICS

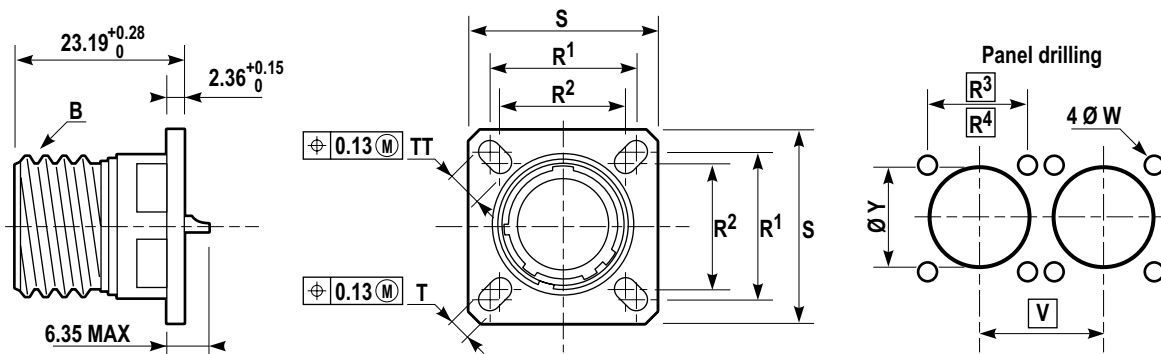
- 9 shell sizes (stainless steel)
- Solder pin contacts in nickel alloy
- Contact plating in active zone: Gold
- Glass insert
- Air leakage $< 1.10^{-7} \text{ cm}^3/\text{s}$ under 1 bar of differential pressure
- Passivation or nickel plating

OVERALL DIMENSIONS - HERMETIC VERSIONS

Square flange receptacle

TVPS02Y JD38999/21Y

TVPS02YN JD38999/21N



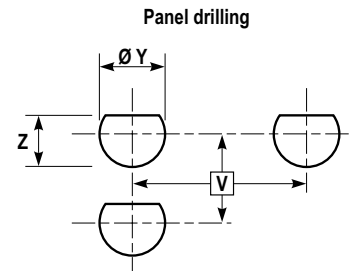
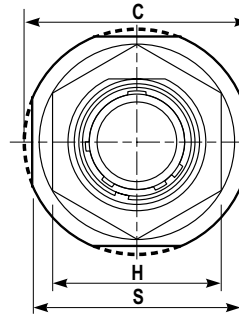
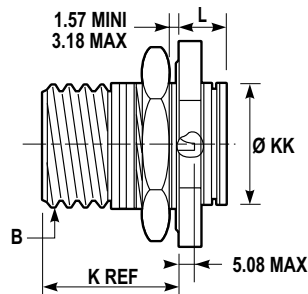
Shell size		B thread Class 2A 0.1P-0.3L-TS (inches)	R ¹ (mm)	R ² (mm)	S ±0.25 (mm)	T +0.20 -0.13 (mm)	TT +0.20 -0.13 (mm)	ØW +0 -0.25 (mm)	R ³ (mm)	R ⁴ (mm)	V Mini (mm)	ØY Mini (mm)
MIL-DTL-38999 Series III	Amphenol											
A	9	.6250	18.26	15.09	23.83	3.25	5.49	3.25	18.26	15.09	24.60	16.66
B	11	.7500	20.62	18.26	26.19	3.25	4.93	3.25	20.62	18.26	27.00	20.22
C	13	.8750	23.01	20.62	28.58	3.25	4.93	3.25	23.01	20.62	31.50	23.42
D	15	1.0000	24.61	23.01	30.96	3.25	4.39	3.25	24.61	23.01	34.50	26.59
E	17	1.1875	26.97	24.61	33.32	3.25	4.93	3.25	26.97	24.61	28.00	30.96
F	19	1.2500	29.36	26.97	36.53	3.25	4.93	3.25	29.36	26.97	40.50	32.94
G	21	1.3750	31.75	29.36	39.67	3.25	4.93	3.25	31.75	29.36	44.00	36.12
H	23	1.5000	34.93	31.75	42.88	3.91	6.15	3.81	34.93	31.75	47.00	39.29
J	25	1.6250	38.10	34.93	46.02	3.91	6.15	3.81	38.10	34.93	50.00	42.47

EXTENDED RANGE

TVS-Y / TVS-YN HERMETIC RECEPTACLES

Jam nut receptacle

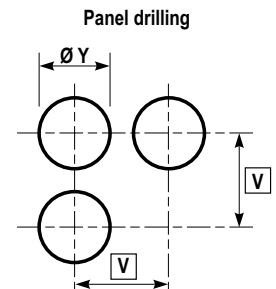
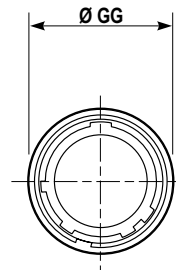
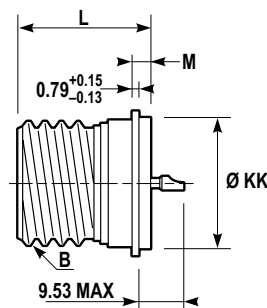
TVS07Y JD38999/23Y
TVS07YN JD38999/23N



Shell size		B thread Class 2A 0.1P-0.3L-TS (inches)	C Maxi (mm)	H/plats +0.043 -0.41 (mm)	L Maxi (mm)	ØKK +0.28 0 (mm)	B ±0.25 (mm)	V Mini (mm)	ØY Mini (mm)	Z +0 -0.25 (mm)	Hex nut max torque value N.m
MIL-DTL-38999 Series III	Amphenol Socapex										
A	9	.6250	30.45	22.23	9.07	16.31	26.97	27.80	17.78	16.99	4.1
B	11	.7500	35.20	25.40	9.07	19.46	31.75	32.60	20.96	19.53	5.3
C	13	.8750	38.38	30.18	9.07	22.66	34.93	36.00	25.65	24.26	6.9
D	15	1.0000	41.55	33.32	9.07	25.86	38.10	39.60	28.83	27.53	8.6
E	17	1.1875	44.73	36.53	9.07	29.01	41.28	43.30	32.01	30.68	9.8
F	19	1.2500	49.50	39.67	9.68	32.21	46.02	47.00	35.18	33.86	10.9
G	21	1.3750	52.65	42.80	9.68	35.36	49.23	50.60	38.35	37.06	12.7
H	23	1.5000	65.85	46.02	9.68	38.56	52.37	54.20	41.53	40.01	13.8
J	25	1.6250	59.00	50.80	9.68	41.71	55.58	59.70	44.70	43.41	15

Solder mounting receptacle

TVSIY JD38999/25Y
TVSIYN JD38999/25N



Shell size		B thread Class 2A 0.1P-0.3L-TS (inches)	ØGG +0.28 -0.25 (mm)	ØKK +0.03 -0.13 (mm)	L +0.28 -0 (mm)	M +0.15 -0.13 (mm)	V Mini (mm)	ØY Mini (mm)
MIL-DTL-38999 Series III	Amphenol							
A	9	.6250	19.05	17.07	20.47	3.18	24.60	17.60
B	11	.7500	21.44	19.84	20.47	3.18	27.00	20.40
C	13	.8750	24.61	23.01	20.47	3.18	31.50	23.50
D	15	1.0000	27.79	26.19	20.47	3.18	34.50	26.70
E	17	1.1875	30.94	29.36	20.47	3.18	38.00	29.90
F	19	1.2500	33.32	31.75	20.47	3.18	40.50	32.30
G	21	1.3750	36.53	34.93	20.47	3.18	44.00	35.50
H	23	1.5000	39.70	38.10	21.29	3.96	47.00	38.60
J	25	1.6250	42.88	41.28	21.29	3.96	50.00	41.80

POLARIZATION

MS Code	Socket contact Amphenol code	MS Code	Pin contact Amphenol code
SN	S (normal)	PN	P (normal)
SA	H	PA	G
SB	J	PB	I
SC	L	PC	K
SD	N	PD	M
SE	T	PE	R

EXTENDED RANGE

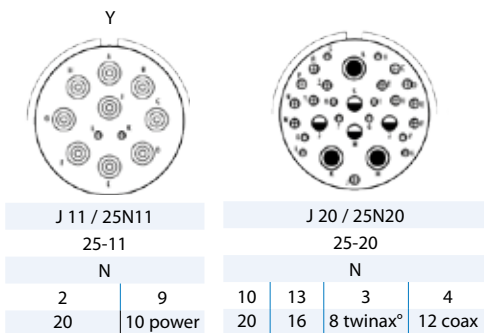
LANYARD RELEASE PLUGS (BREAKAWAY CONNECTORS)

PRESENTATION

Amphenol Breakaway Connectors provide unequalled performance in environments requiring instant disengagement.

Designed to provide quick disconnect of a connector plug and receptacle with an axial pull on the lanyard, the "Breakaway" Fail Safe connector family offers a wide range of electrical and mechanical features:

- Compatible/intermateable with MIL-DTL-38999 series III receptacles
- Quick disconnect between plug and receptacle and damage free separation
- Up to 15° misalignment for instant desengagement
- Tread coupling (tri start connector)
- Other shell size and arrangements available in MIL-DTL-38999 standard lanyard versions
- 2 arrangements available for MIL-STD-1760 applications :



POLARIZATION

MS Code	Socket contact Amphenol code	MS Code	Pin contact Amphenol code
SN	S (normal)	PN	P (normal)
SA	H	PA	G
SB	J	PB	I
SC	L	PC	K
SD	N	PD	M
SE	T	PE	R

OVERALL DIMENSIONS

Lanyard release plugs - MIL-STD-1760

TVFBRW

JD38999/31W

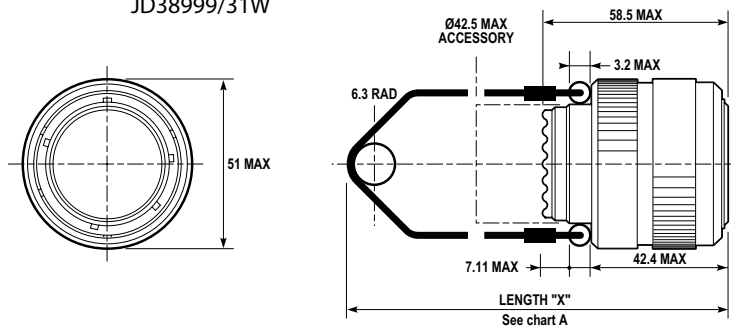


TABLE A

Length "X" MIL.STD 1760 coding	mm
A*	102
B*	115
C*	127
D	140
E	153
F	166
G	178
H	191
J	407
K	229
M	254
X	432

Other lengths are also available under TVFBRW proprietary designation. Consult us.

* for TV FBRW only

EXTENDED RANGE

LANYARD RELEASE PLUGS (BREAKAWAY CONNECTORS)

Lanyard release plugs

Standard version

(ordering information, see section "How to Order")

885565...P	JD38999/29W
915565...P	JD38999/29F
885565...S	JD38999/30W
915565...S	JD38999/30F

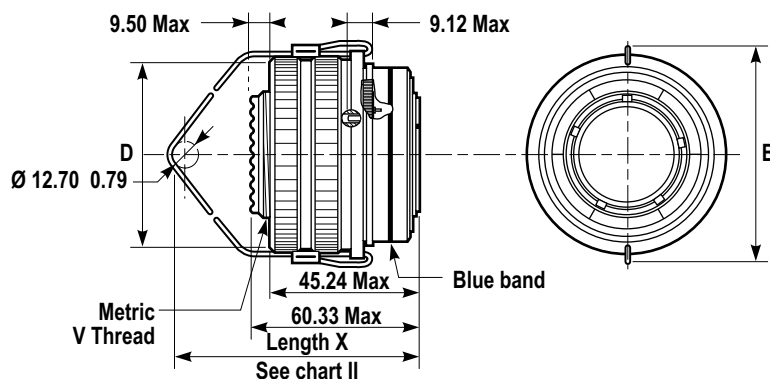


TABLE I

Arrangement code	Insert arrangement
04	11-04
06	11-35
07	11-98
08	11-02
10	13-4
11	13-08
13	13-98
14	13-35
18	15-5
19	15-19
20	15-35
21	15-97
22	15-18
23	15-15
27	17-06
28	17-08
29	17-26
30	17-35
31	17-99
37	19-11
38	19-28
39	19-32
40	19-35
47	21-11
48	21-16
49	21-35
50	21-41
51	21-39
57	23-21
58	23-35
59	23-53
60	23-55
61	23-54
66	25-19
67	25-29
68	25-35
69	25-43
70	25-61
71	25-04
72	25-24
73	25-46

TABLE II

Shell size		Metric Max	B Max (mm)	D Max (mm)
MIL-DTL-38999 Series III	Amphenol			
B	11	M15X1.0-6G	46.89	28.17
C	13	M18x1.0-6g	50.09	31.75
D	15	M22X1.0-6G	52.81	34.93
E	17	M25X1.0-6G	56.01	38.10
F	19	M28X1.0-6G	58.45	41.28
G	21	M31X1.0-6G	62.79	44.45
H	23	M34X1.0-6G	65.89	47.63
J	25	M37X1.0-6G	68.71	50.08

TABLE III

Length "X" (mm)	Code MS/Amphenol
102	A
115	B
127	C
140	D
153	E
166	F
178	G
191	H
203	I
216	J
229	K
242	L
254	M
267	N
280	P
293	R
305	S
318	T
331	U
356	V
381	W
407	X
432	Y
458	Z

EXTENDED RANGE THRU-BULKHEAD RECEPTACLES

TVB thru-bulkhead receptacles are used for the feed through of circuits on bulkheads or panels.



- Intermateable with MIL-DTL-38999 Series III connectors
- 9 shell sizes
- Interfacial seal on male side
- Olive drab cadmium or nickel plating
- Coding possibility

HOW TO ORDER

Thru-bulkhead Receptacles	TVB	W	15 35	PS	N	F467
Shell Material and finish W: Olive drab cadmium plated aluminium F: Electroless nickel plated aluminium B: Marine bronze ZN: Black Zinc Nickel						
Shell size and insert arrangements: see section "Insert Arrangements"						
Contact type PS: Pin & Socket						
Coding N, A, B, C, D, E						
Deviation F467: Drilled and tapped mounting holes (recommended)						

For further information, please consult us.

RANGE DERIVATED RECEPTACLES WITH ENHANCED SEALING

TV07 ETC receptacles with enhanced sealing are derived from the standard MIL-DTL-38999 Series III receptacles. The inserts have been modified to ensure an air leakage of $< 1.10^{-6} \text{cm}^3/\text{s}$ under 1 bar of differential pressure.



- Intermateable with MIL-DTL-38999 Series III connectors
- 9 shell sizes
- Solder or PCB pin contacts. Socket contacts available upon request

HOW TO ORDER

Series	TV	07	W	ET	C	15 35	P	A
Shell Type Jam nut receptacle: 175°C (O.D. cadmium): 07 200°C (nickel, bronze): S07								
Shell material, finish and contact type W: Olive drab cadmium plated aluminium F: Electroless nickel plated aluminium B: Marine bronze Z: Green zinc cobalt plated aluminium ZN: Black zinc nickel plated aluminium								
Enhanced sealing								
Contact termination C: Solder contacts CI: Standard PCB contacts LI: Long tail PCB contacts								
Shell size and insert arrangements: see section "Insert Arrangements"								
Contact type P: Pin								
Coding Blank for normal, A, B, C, D, E								

For further information, please consult us.

EXTENDED RANGE

INTEGRATED BACKSHELLS

MAIN CHARACTERISTICS

- All in one product
- Time saving during order and installation
- Space and weight saving
- Deviation : F472



Available on plugs and receptacles, these 2 in 1 connectors/band backshells provide a high EMI protection with a quick, easy and cost effective cabling process. They are low profile, with enhance sealing level and allow the use of macro and micro bands, as well as straight or right angle heat shrink moulded pieces. The design of the shells makes them compatible with over moulding process.

For further information, please consult us.

EXTENDED RANGE

MIL-DTL-38999 SERIES III OPTICAL CONNECTORS

TVOP

The TVOP connector is an optical version of the MIL-DTL-38999 series III connector, which uses standard 2.5 mm telecom optical termini in dedicated high precision inserts. It is designed to provide high level of performance and reliability, and cost effective solution for outdoor and indoor applications.



- 1 to 8 channels
- Available in multimode, singlemode PC and singlemode APC
- 0.5 dB typical Insertion Loss in multimode and singlemode

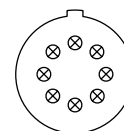
Insert arrangements



11-2



13-4



17-8

STARTOP

The STARTOP connector is made of standard MIL-DTL-38999 electrical connectors, using size 16 MIL-PRF-29504 optical termini. Hybrid versions (electrical and optical) are available, for further details please consult us.



- 1 to 8 channels
- Available in multimode
- 0.8 dB typical Insertion Loss

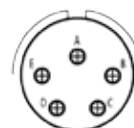
Insert arrangements



11-02



13-04



15-05



17-08

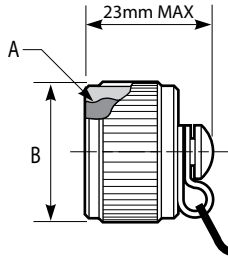
For further details, please consult the EWOC catalog (DOC-000503-ANG).

ACCESSORIES

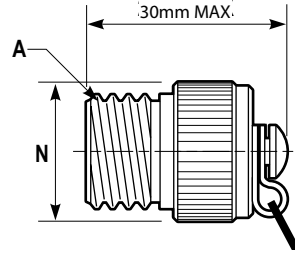
PROTECTIVE CAPS

STANDARD METALLIC CAPS

- For receptacles & plugs
- IP 68 (permanent sealing)



Protection cap for receptacles equipped with metallic chain, nylon cord or stainless steel rope



Protection cap for plugs equipped with metallic chain, nylon cord or stainless steel rope

Cap type	Metallic chain length (mm)	Nylon cord length (mm)	Stainless steel rope length (mm)
BEC/BER for receptacle	152	±105	127
BF for plug	127	160	127

Shell size		A thread 0.1P-0.3L-TS Class 2B (inches)	B Dia Max (mm)	C Dia Min (mm)	N Dia Max (mm)
MIL-DTL-38999 Series III	Amphenol				
A	9	.6250	22.23	17.86	22.73
B	11	.7500	25.40	21.44	25.40
C	13	.8750	28.58	25.81	29.74
D	15	1.0000	31.75	28.98	32.99
E	17	1.1875	36.53	32.16	36.47
F	19	1.2500	38.10	36.27	39.19
G	21	1.3750	41.28	38.51	42.42
H	23	1.5000	44.45	41.68	45.39
J	25	1.6250	47.63	44.86	48.62

ORDERING INFORMATION

Standard Metallic Caps	B	EC	N	TV	W	15
Protection cap type EC: For square flange receptacle ER: For jam nut receptacle F: For plug						
Wire type N: Nylon cord Blank for metallic chain R: Jacketed stainless steel rope RO: Jacketed stainless steel rope with washer end (only for plug)						
Connector type						
Finish B: Bronze ✓ F: Electroless nickel plated, aluminium version ✓ W: Olive drab cadmium plated aluminium version Z: Green zinc cobalt plated aluminium ✓ ZN: Black zinc Nickel aluminium from Amphenol Europe ✓						
Corresponding connector shell size: 09/11/13/15/17/19/21/23/25						

For stainless steel caps, please consult us

✓: RoHS compliant

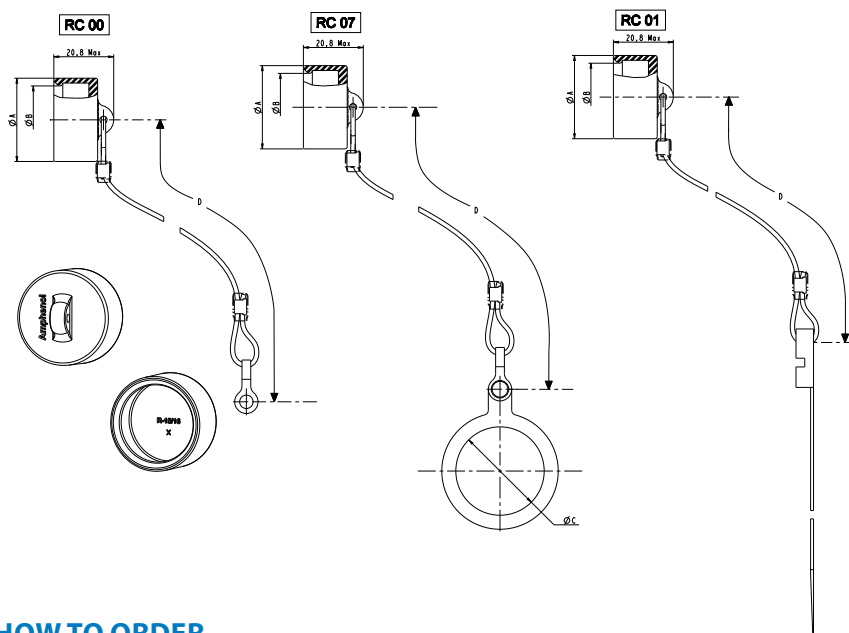
ACCESSORIES

PROTECTIVE CAPS

RUBBER CAPS

NEW

- For receptacles
- IP67 (1m, 1 hour sealing)



Sizes	ØA Max	ØB Max	ØC Max ^{+0,25} ₀	D Max
9	19,25	13,85	17,86	140
11	22,55	17,2	22,63	140
13	25,95	20,6	25,81	140
15	28,75	23,4	30,24	140

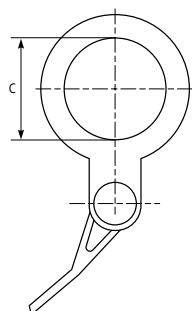
HOW TO ORDER

Cap Series	RC	00	N	TV	9
Protection cap type					
00: For square flange receptacle					
07: For jam nut receptacle					
01: For line receptacle					
Wire type					
N: Nylon cord					
Connector type					
Shell size:					
09/11/13/15/17/19					

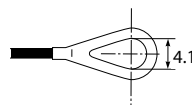
ACCESSORIES

PROTECTIVE CAPS - TERMINATION TYPE

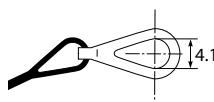
For both standard Metallic Caps & Rubber Caps



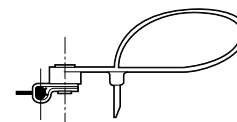
Termination of the chain, rope (RO type) or cord for jam nut receptacle protection caps



Termination of the cord or rope (R type) for square flange receptacle protection caps



Termination of the chain for square flange receptacle and plug protection caps



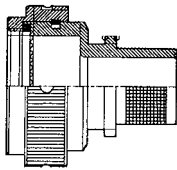
Termination of the cord for plugs protection caps

ACCESSORIES

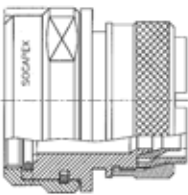
BACKSHELLS



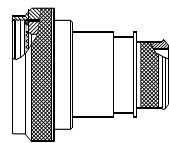
SHIELDING

**TV-35: BAND BACKSHELL FOR SHIELDING**

- Full 360° shield termination
- Available with different cabling chambers
- Easy maintenance or repairability
- Sealing ensured by straight or right angled heat-shrink molded piece
- Right angle version: TV SBC

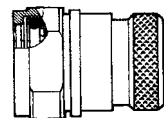
**TV NSA: HIGH LEVEL OF EMI/RFI PROTECTION**

- Electrical continuity between cable and connector by clamping the braid with a screwing system
- Free inner ring to avoid twisting of the braid when screwing
- Sealing ensured by straight or right angle heat-shrink molded piece

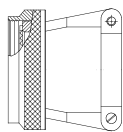
**M85049/88: BAND LOCK ADAPTOR**

- MIL standardized band backshell
- Full 360° termination
- Sealing ensured by straight or right angle heat-shrink molded piece
- Right angle and 45° versions available

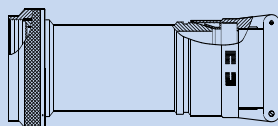
SEALING

**TV NSD: ADAPTER FOR HEAT-SHRINK MOLDED PIECE**

MECHANICAL RETENTION

**M85049/38 - M85049/38S: STRAIN RELIEF CLAMP**

- MIL standardized strain relief clamp
- Mechanical retention of the cable
- Easy maintenance or repairability
- Self locking option available

**M85049/19: NON-ENVIRONMENTAL EMI/RFI BACKSHELL**

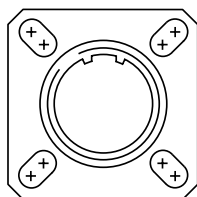
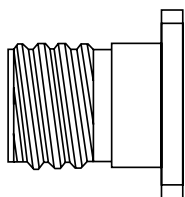
- 360° screen termination
- Strain relief cable holding mechanism

For more detailed information, consult our Backshell catalog (E118)

ACCESSORIES

OTHER ACCESSORIES

DUMMY RECEPTACLES



- Dummy receptacles match all plug types with any shell coding (N, A, B, C, D, E)
- Dimensions are identical to the front part of TVP00 receptacles
- A rubber washer ensures correct sealing of mated connectors
- Specific polarized versions are available on request

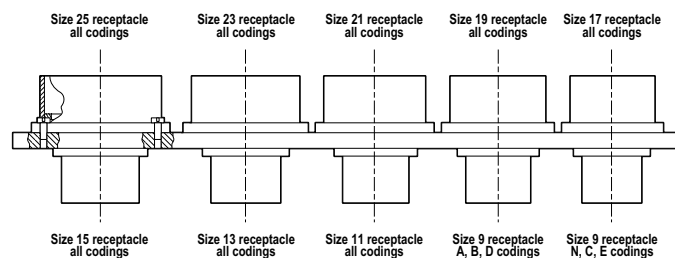
How to order - Amphenol designation

Dummy receptacle	SE	00	TV	W	11
Shell type 00: derived from the TV square flange receptacle					
Series					
Finish W: Olive-drab cadmium plated F: Electroless nickel plated ✓ B: Marine Bronze ✓ ZN: Black Zinc Nickel plated ✓					
Shell size 09/11/13/15/17/19/21/23/25					

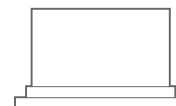
✓: RoHS compliant

HOLDING SUPPORT EQUIPPED WITH OLIVE DRAB CADMIUM DUMMY RECEPTACLES

REFERENCE: 809 931



PLASTIC DUST CAPS



Shell size	Plastic dust caps for plug	Plastic dust caps for receptacles
9	606062	606061
11	805414	606062
13	606073	606063
15	606066	606064
17	606067	606065
19	606068	606066
21	606070	606067
23	606079	606068
25	606079	606069

ACCESSORIES

OTHER ACCESSORIES

CRIMP CONTACTS

	Contact size	Pin contacts		Socket contacts	
		Proprietary No	Military No	Proprietary No	Military No
Signal and Power	00	Refer to catalog contacts (DOC-000081-ANG)		Refer to catalog contacts (DOC-000081-ANG)	
	4	900007	-	900047	-
	8*	900197 900198**	-	900217	-
	12	900005	M39029/58-365	900045	M39029/56-353
	16	900000	M39029/58-364	900040	M39029/56-352
	20	900001	M39029/58-363	900041	M39029/56-351
	22D	900004	M39029/58-360	900044	M39029/56-348
	23	900049	M39029/18-177	900048	M39029/17-172

* Use with piggy back grommets is mandatory

** For arrangement 21-48 only

	Contact size	Pin contacts		Socket contacts		Cable Type
		Proprietary No	Military No	Proprietary No	Military No	
Coax	8*	900130	M39029/60-367	900140	M39029/59-366	M17/95-RG180
		900135	-	900145	-	M17/94-RG179 M17/113-RG316 M17/119-RG174
	12	900340	M39029/28-211	900350	M39029/75-416	M17/94-RG179 M17/113-RG316 M17/119-RG174
		900341	M39029/28-409	900351	M39029/75-417	M17/95-RG180 Raychem 9528 A1318
		900342***	-	900352**	-	M17/113-RG316
	16	900132	M39029/76-424	900142	M39029/77-428	M17/94-RG179 M17/113-RG316 M17/119-RG174 KX22A
		900131	M39029/76-425	900141	M39029/77-429	M17/93-RG178 M17/169-00001
Twinax	8*	074834	M39029/90-529	072453	M39029/91-530	M17/176-00002
Twinax	8*	600611	-	600614	-	M17/176-00002
Quadrax 100Ω	8	900330	-	900338	-	Tensolite NF24 Q100
Optical contact	16	-	M29504/4-4040	-	M29504/5-4046	50/125 & 62.5/125 fiber

* Use with piggy back grommets is mandatory

*** High performance size 12 coaxial contacts 50 ohms matched

For other cable types, please consult us

PIGGY BACK GROMMETS

The piggy back grommets insure back contact sealing when using size 8 power, coax, twinax or quadrax contacts. Quadrax contact part numbers always include piggy back grommets.



Type of contact	Cable OD (mm)	Proprietary No
Size 8 power	4.4 to 5.2	900471
Size 8 twinax and coax	3 to 4.4	900472
Size 8 twinax and coax	3 to 4.4	900476 ****

**** to use for arrangements 25-20, 19-17

ACCESSORIES

OTHER ACCESSORIES

SEALING PLUGS

To be mounted behind the crimp contacts

Contact size	Proprietary No	Military No
8 power	900024	-
12	900023	MS27488-12-2
16	900020	MS27488-16-2
20	900021	MS27488-20-2
22D	900022	MS27488-22-2
23	900022	MS27488-22-2

DUMMY CONTACTS

To be mounted instead of the contacts

Contact size	Dummy contact material	Proprietary No
4	White plastic	900329
8	Green plastic	900488
8	Brass + gold finish	900183
8	White plastic (recommended)	900029
12	Brass + gold finish	900025
12	White plastic	900486
16	Brass + gold finish	900028
16	Blue plastic	900026
20	Brass + gold finish	900332

Metal dummy contacts are recommended for applications requesting EMI protection.

STANDARD PC TAIL CONTACTS

	Contact size	Type	Pin contacts		Socket contacts	
			Tail dimension (mm)	Proprietary No	Tail dimension (mm)	Proprietary No
Signal	12	CI	5	900238	5	900403
	16	CI	5	900240	5	900263
		LI	8.5	900246	8.5	600526
	20	CI	5	900241	5	900251
		LI	8.5	900243	8.5	900252
	22D	CI	5	900245	5	900256
		LI	8.5	922389	8.5	922390
Coax	23	CI	5	900458	5	900459
	12	-	consult us	900489	-	-
		-	consult us	900409	-	-
	16	-	consult us	900184**	consult us	900405
Twinax	8	-	consult us	072265	-	-

** 900179 = 900184 + tin plating

Other PC tail lengths are available, please consult us.

ACCESSORIES

OTHER ACCESSORIES

REDUCING FERRULES

Reducing ferrules allow using cables with smaller diameters than specified in the table part electrical characteristics

Reducing ferrule No	Contact size	Wire Gauge	Pin contacts	Socket contacts
No reducing ferrule	8	8	900197 / 900198	900217
900154		10		
No reducing ferrule	12	12	900005	900045
		14		
		16		
900092		16		
		18		
		20		
900093		20		
		22		
		24		
No reducing ferrule	16	16	900000	900040
		18		
		20		
		22		
900091		24		
		26		
		28		
No reducing ferrule	20	20	900001	900041
		22		
		24		
		26		
900090		28		
900094	22D	34	900004	900044
900099		30		
No reducing ferrule		22		
		24		
		26		
		28		

The sealing of mated connectors is only guaranteed for the minimum wire outside diameter given in the table part electrical characteristics.

1500 CYCLES CRIMP CONTACTS (FOR CTV ONLY)

	Contact size	Pin contacts		Socket contacts	
		Proprietary No	Military No	Proprietary No	Military No
Signal	20	900318	M39029/107-621	900323	M39029/106-615
	22D	900317	M39029/107-620	900322	M39029/106-614
	16	900319	M39029/107-622	900324	M39029/106-616

ACCESSORIES

APPLICATION TOOLS

CRIMPING TOOLS



Contact size	Contact type	Contact part number		Crimping tool		Positioner	
		Proprietary No	Military No	Proprietary No	Military No	Proprietary No	Military No
00		Refer to catalog contacts (DOC-000081-ANG)					
4	P	900007	-	809947	-	809948	-
	S	900047	-	809947	-	809948	-
8 Coax		Inner pin & socket		809 801	M22520/2-01	-	M22520/2-31
		Outer pin & socket		809 914	M22520/5-01	809 915	M22520/5-41
8 Power	P	900 197	-	809 872	-	809 873	-
	P	900 198	-	809 872	-	809 873	-
	S	900 217	-	809 872	-	809 873	-
12 Coax		Inner pin & socket		809 801	M22520/2-01	809 932	M22520/2-34
		Outer pin & socket		809 926	M22520/31-01	809 927	M22520/31-02
12	P	900 005	M39029/58-365	809 857	M22520/1-01	809 858	M22520/1-04
	S	900 045	M39029/56-353	809 857	M22520/1-01	809 858	M22520/1-04
16 Coax		Inner pin & socket		809 801	M22520/2-01	809 862	M22520/2-35
		Outer pin & socket		809 863	M22520/4-01	809 864	M22520/4-02
16	P	900 000	M39029/58-364	809 857	M22520/1-01	809 858	M22520/1-04
	S	900 040	M39029/56-352	809 857	M22520/1-01	809 858	M22520/1-04
20	P	900 001	M39029/58-363	809 857	M22520/1-01	809 858	M22520/1-04
				809 801	M22520/2-01	809 826	M22520/2-10
	S	900 041	M39029/56-351	809 857	M22520/1-01	809 858	M22520/1-04
				809 801	M22520/2-01	809 826	M22520/2-10
22D	P	900 004	M39029/58-360	809 801	M22520/2-01	809 810	M22520/2-09
	S	900 044	M39029/56-348	809 801	M22520/2-01	809 835	M22520/2-07
23	P	900 049	M39029/18-177	809801	M22520/2-01	809 691	M22520/2-13
	S	900 048	M39029/17-172	809801	M22520/2-01	809 692	M22520/2-16

INSERTION AND REMOVAL TOOLS

Plastic tools



Contact size	Insertion tool		Removal tool		Colour	
	Proprietary No	Military No	Proprietary No	Military No	Insertion	Extraction
8 Power/coax	*	*	-	M81969/14-12	-	green
12	809 859	M81969/14-04	809 859	M81969/14-04	yellow	white
16	809 855	M81969/14-03	809 855	M81969/14-03	blue	white
20	809 854	M81969/14-10	809 854	M81969/14-10	red	orange
22D	809 856	M81969/14-01	809 856	M81969/14-01	green	white

* Manual insertion

Metallic tools



Contact size	Straight type		Angle type			
	Insertion tools Proprietary No	Removal tools Proprietary No	Insertion tools		Removal tools	
			Proprietary No	Military No	Proprietary No	Military No
4	*	809943	-	-	-	-
8 Power/coax	-	809961	*	*	809 845	M81969/8-14
12	-	-	809 838	M81969/8-09	809 839	M81969/8-10
16	809 816	809 846	809 812	M81969/8-07	809 820	M81969/8-08
20	809 817	809 847	809 813	M81969/8-05	809 821	M81969/8-06
22D	809 819	809 849	809 815	M81969/8-01	809 823	M81969/8-02
23	810 010	810 010	-	-	-	-

* Manual insertion

HOW TO ORDER

STANDARD VERSIONS

AMPHENOL DESIGNATION

Series	TV	P00	R	Q	W	17-75	P	A	-	-
TV: Metallic shell										
CTV: Composite shell										
Shell type										
P00: Square flange receptacle: 175°C (O.D. cadmium, g.zinc cobalt, ni-PTFE, b.zinc nickel)										
PS00: Square flange receptacle: 200°C *** (nickel, s.steel, bronze)										
07: Jam nut receptacle: 175°C (O.D. cadmium, g.zinc cobalt, ni-PTFE, b.zinc nickel)										
S07: Jam nut receptacle: 200°C *** (nickel, s.steel, bronze)										
06: Straight plug: 175°C (O.D. cadmium, g.zinc cobalt, ni-PTFE, b.zinc nickel)										
S06: Straight plug: 200°C *** (nickel, s.steel, bronze)										
01: In line receptacle 175°C (O.D. cadmium, g.zinc cobalt, ni-PTFE, b.zinc nickel)										
S01: In line receptacles 200°C *** (nickel, s.steel, bronze)										
02: P00 without rear threat (no poss. for backshell) 175°C (O.D. cadmium, g.zinc cobalt, ni-PTFE, b.zinc nickel)										
S02: PS00 without rear threat (no poss. for backshell) 200°C *** (nickel, s.steel, bronze)										
Contact type										
R: Crimp contacts (or connector delivered without contact)										
Omit for PC tail contacts, Durmalon plating and black zinc nickel plating										
Ground Plane receptacle and Quadrax contact options										
G: conductive insert										
Q: insert compatible with quadrax or differential twinax contacts **										
GQ: conductive insert compatible with quadrax or differential twinax contacts										
Omit for standard receptacle (without conductive insert) and insert without quadrax contact										
Class										
W: Olive Drab Cadmium plating (on aluminium or composite)										
F: Nickel Plating (on aluminium or composite) ✓										
K: Passivated Stainless Steel ✓										
S: Nickel plated Stainless Steel ✓										
B: Marine Bronze (copper aluminium alloy) ✓										
DT: Durmalon plating (Nickel - PTFE) ✓										
Z: Green zinc Cobalt plated aluminium ✓										
ZN: Black Zinc Nickel plated aluminium ✓										
PC Tail Contacts										
Omit for crimp contacts										
CI: standard PCB contacts										
LI: long tail PCB contacts										
Shell size and Contact arrangement ***										
See section "Insert Arrangements"										
Contact type										
P: Pin (500 cycles)										
S: Socket (500 cycles)										
H: Pin (1500 cycles - CTV only)										
J: Socket (1500 cycles - CTV only)										
Polarization										
Blank for normal or A, B, C, D, E . See coding system, section "Insert Arrangements", sub-section "coding polarization"										
Contacts										
Omit for connectors delivered with contacts										
LC: Connector delivered without contacts										
Deviation										
F404 / F404LF / F404LFC: Tinned PCB contacts (lead tinned / silver tinned / silver-copper tinned)										
F485 (for TVS06 RB only): Coupling nut conforms to CECC75 - 201 - 002A (for arctic gloves)										
F459 / F459LF / F459LFC: stand-off receptacle (lead tinned / silver tinned / silver-copper tinned)										
F472 Integrated backshells										
For other deviations (FXXX), please <i>consult us</i> .										

** For Quadrax or dif. Twinax compatible inserts, please omit the "S" corresponding to 200°C compatibility when applicable, in the P/N. Ex: CTV07RGQF17 52PLC
For other arrangements, shell, coding or deviation, please consult us.

***For high-density contact arrangement, please omit the « S » corresponding to 200°C compatibility in the P/N. High-density inserts are +175°C maxi compatible. Ex: TVP 00 RF 09 09 S

✓: RoHS compliant

HOW TO ORDER

STANDARD VERSIONS

MILITARY DESIGNATION (CRIMP CONTACTS ONLY)

Series	JD38999/	20	F	H	53	P	A
Shell type 20: Square flange receptacle 24: Jam nut receptacle 26: Straight plug							
Shell material and finish <u>Composite</u> J: Olive drab cadmium plated 175°C M: Electroless nickel plated 200°C ✓							
<u>Aluminium</u> W: Olive drab cadmium plated 175°C F: Electroless nickel plated 200°C ✓ T: Nickel PTFE plated 175°C ✓ Z: Black Zinc Nickel plated aluminium 175°C ✓							
<u>Stainless steel</u> K: Passivated 200°C, firewall capability ✓ S: Nickel plated 200°C, firewall capability ✓							
Shell size A B C D E F G H J MIL 09 11 13 15 17 19 21 23 25 Amphenol							
Contact arrangement See section "Insert Arrangements"							
Contact and connector type A: Without pin contact B: Without socket contact P: With pin contacts S: With socket contacts H: With 1500 cycles pin contacts (only valid for composite) J: With 1500 cycles socket contacts (only valid for composite)							
Polarization N for normal or A, B, C, D, E. See coding system, section "Insert Arrangements"							

✓: RoHS compliant

EN3645 (EUROPEAN NORM ORDERING INFORMATION, ASD-STAN) - (CRIMP CONTACTS ONLY)

Standard number	EN3645	F	0	G	N	16	A	N
Class: W: Crimp version, Aluminum Olive drab cadmium plated, 175°C F: Crimp version, Aluminum Nickel plated, 200°C ✓ J: Crimp version, Composite material Olive Drab cadmium plated, 175°C M: Crimp version, Composite material Nickel plated, 200°C ✓ K: Crimp version, Passivated Stainless Steel, 200°C ✓								
Shell style: 0: Square flange receptacle 7: Jam Nut Receptacle 6: Plug								
Shell size code: A for 09, B for 11, C for 13, D for 15, E for 17, F for 19, G for 21, H for 23, J for 25								
Insert type: N: Standard G: Grounded cavities Q: Quadrx insert, grounded L: Quadrx insert, non grounded R: Power insert								
Contact arrangement according to EN3645-002: See section "Insert Arrangements"								
Contact code: M: with Pin contacts F: with Socket contacts Coax, twinax, quadrx contacts are not supplied with the connector A: without Pin contacts B: without Socket contacts								
Polarization (Key Ways rotation): N, A, B, C, D, E. See coding system, section "Insert Arrangements"								

HOW TO ORDER

HERMETIC VERSIONS

AMPHENOL DESIGNATION

Series	TV	SI	YN	11	35	P	-
Shell type PS02: Square flange receptacle S07: Jam nut receptacle SI: Solder mounting receptacle							
Shell material and finish Y: Stainless steel passivated ✓ YN: Stainless steel nickel plated ✓							
Shell size: 09/11/13/15/17/19/21/23/25							
Contact arrangement See section "Insert Arrangements", marked with "Y"							
Contact type P: Pin							
Polarization Blank for normal or A, B, C, D, E. See coding system, section "Insert Arrangements"							

MILITARY DESIGNATION

Connector type	JD38999/	25	N	B	35	P	N
Shell type 21: Square flange receptacle 23: Jam nut receptacle 25: Solder mounting receptacle							
Shell material and finish Y: Stainless steel passivated ✓ N: Stainless steel nickel plated ✓							
Shell size A B C D E F G H J MIL 09 11 13 15 17 19 21 23 25 Amphenol							
Contact arrangement See section "Insert Arrangements", marked with "Y"							
Contact type P: Pin							
Polarization N for normal or A, B, C, D, E. See coding system, section "Insert Arrangements"							

✓: RoHS compliant

HOW TO ORDER

LANYARD RELEASE PLUGS - STANDARD VERSIONS

AMPHENOL DESIGNATION

Shell finish 88: Olive-drab cadmium plated 91: Nickel plated ✓	88	5565	20	K	P
Connector type					
Shell size and arrangement code See table I, section "Range Derivated", Sub-section "Lanyard Release Plugs" Others, please consult us					
Lanyard length A to Z code (see table III, section "Range Derivated", Sub-section "Lanyard Release Plugs")					
Contact type and polarization See chart below and coding, section "Insert Arrangement"					

MILITARY DESIGNATION

Connector type JD38999/ 29: Plug with pin contacts 30: Plug with socket contacts	JD38999/	29	W	D	35	E	N
Shell finish W: Olive drab cadmium plated F: Nickel plated ✓							
Shell size A* B C D E F G H J MIL 09* 11 13 15 17 19 21 23 25 Amphenol * Please consult us							
Contact arrangement See table I, section "Range Derivated", Sub-section "Lanyard Release Plugs"							
Lanyard length A to Z code (see table III, section "Range Derivated", Sub-section "Lanyard Release Plugs")							
Polarization N for normal or A, B, C, D, E. See coding, section "Insert arrangement"							

✓: RoHS compliant

HOW TO ORDER

LANYARD RELEASE PLUGS - COMPATIBLE WITH
MIL-STD-1760 APPLICATIONS

AMPHENOL DESIGNATION

Series	TV	FB	RW	25-11	P	E
FB: MIL-STD-1760 lanyard release plug						
RW: Olive drab cadmium plated						
Arrangement 25-11, 25-20: see section "Insert Arrangements"						
Contact type and polarization G: 25-11 arrangement, pin contacts only P: 25-20 arrangement, pin contacts only						
Lanyard length Other lengths are available upon request. See table A, section "Range Derivated", sub-section "Lanyard Release Plugs"						

MILITARY DESIGNATION

Series	JD38999/	31	W	E	11	N	1
Shell and contact type 31: Plug with pin contacts, per MIL-STD-1760							
Shell finish W: Olive drab cadmium plated 175°C							
Lanyard length. See table A, section "Range Derivated", sub-section "Lanyard Release Plugs"							
Contact arrangement 11: 25-11 arrangement 20: 25-20 arrangement							
Polarization N for 25-20 arrangement. See section "Insert Arrangement" A for 25-11 arrangement.							
Plug locking ring type 1: Ø 51mm (low profile) 2: Ø 68mm (please consult us)							

For MIL-STD-1760 Type II connectors, please consult us.

Handwriting practice lines consisting of 20 horizontal dotted lines.

HOW TO ORDER

CROSS REFERENCES

Shell material	MIL-DTL-38999 Series III	EN 3645	AMPHENOL
Composite shell	JD38999/20J X XX A °	EN3645 J0 X N XX A °	CTVP00RW ■■■ ## P ^ LC
			CTVP00WCI ■■■ ## P ^ LC
		EN3645 J0 X L XX A °	CTVP00RQW ■■■ ## P ^ LC
		EN3645 J0 X Q XX A °	CTVP00RGQW ■■■ ## P ^ LC
	JD38999/20M X XX A °	EN3645 M0 X N XX A °	CTVPS00RF ■■■ ## P ^ LC
			CTVPS00FCI ■■■ ## P ^ LC
		EN3645 M0 X L XX A °	CTVP00RQF ■■■ ## P ^ LC
		EN3645 M0 X Q XX A °	CTVP00RGQF ■■■ ## P ^ LC
	JD38999/24J X XX A °	EN3645 J7 X N XX A °	CTV07RW ■■■ ## P ^ LC
			CTV07WCI ■■■ ## P ^ LC
		EN3645 J7 X L XX A °	CTV07RQW ■■■ ## P ^ LC
		EN3645 J7 X Q XX A °	CTV07RGQW ■■■ ## P ^ LC
	JD38999/24M X XX A °	EN3645 M7 X N XX A °	CTVS07RF ■■■ ## P ^ LC
			CTVS07FCI ■■■ ## P ^ LC
		EN3645 M7 X L XX A °	CTV07RQF ■■■ ## P ^ LC
		EN3645 M7 X Q XX A °	CTV07RGQF ■■■ ## P ^ LC
Aluminium shell	JD38999/26J X XX A °	EN3645 J6 X N XX A °	CTV06RW ■■■ ## P ^ LC
		EN3645 J6 X L XX A °	CTV06RQW ■■■ ## P ^ LC
	JD38999/26M X XX A °	EN3645 M6 X N XX A °	CTVS06RF ■■■ ## P ^ LC
		EN3645 M6 X L XX A °	CTV06RQF ■■■ ## P ^ LC
	JD38999/20W X XX A °	EN3645 W0 X N XX A °	TVP00RW ■■■ ## P ^ LC
			TVP00WCI ■■■ ## P ^ LC
		EN3645 W0 X L XX A °	TVP00RQW ■■■ ## P ^ LC
	JD38999/20Z X XX A °		TVP00ZN ■■■ ## P ^ LC
			TVP00ZNCI ■■■ ## P ^ LC
			TVP00RQZN ■■■ ## P ^ LC
			TVP00RGQZN ■■■ ## P ^ LC
		EN3645 W0 X Q XX A °	TVP00RGQW ■■■ ## P ^ LC
	JD38999/20F X XX A °	EN3645 F0 X N XX A °	TVPS00RF ■■■ ## P ^ LC
			TVPS00FCI ■■■ ## P ^ LC
		EN3645 F0 X L XX A °	TVP00RQF ■■■ ## P ^ LC
		EN3645 F0 X Q XX A °	TVP00RGQF ■■■ ## P ^ LC
	JD38999/24W X XX A °	EN3645 W7 X N XX A °	TV07RW ■■■ ## P ^ LC
			TV07WCI ■■■ ## P ^ LC
		EN3645 W7 X L XX A °	TV07RQW ■■■ ## P ^ LC
		EN3645 W7 X Q XX A °	TV07RGQW ■■■ ## P ^ LC
	JD38999/24Z X XX A °		TV07ZN ■■■ ## P ^ LC
			TV07ZNCI ■■■ ## P ^ LC
			TV07RQZN ■■■ ## P ^ LC
			TV07RGQZN ■■■ ## P ^ LC
	JD38999/24F X XX A °	EN3645 F7 X N XX A °	TVS07RF ■■■ ## P ^ LC
			TVS07FCI ■■■ ## P ^ LC
		EN3645 F7 X L XX A °	TV07RQF ■■■ ## P ^ LC
		EN3645 F7 X Q XX A °	TV07RGQF ■■■ ## P ^ LC
	JD38999/26W X XX A °	EN3645 W6 X N XX A °	TV06RW ■■■ ## P ^ LC
		EN3645 W6 X L XX A °	TV06RQW ■■■ ## P ^ LC
	JD38999/26Z X XX A °		TV06ZN ■■■ ## P ^ LC
			TV06RQZN ■■■ ## P ^ LC
	JD38999/26F X XX A °	EN3645 F6 X N XX A °	TVS06RF ■■■ ## P ^ LC
		EN3645 F6 X L XX A °	TV06RQF ■■■ ## P ^ LC
Stainless Steel shell	JD38999/20K X XX A °	EN3645 K0 X N XX A °	TVPS00RK ■■■ ## P ^ LC
			TVPS00KCI ■■■ ## P ^ LC
	JD38999/20S X XX A °		TVPS00RS ■■■ ## P ^ LC
			TVPS00SCI ■■■ ## P ^ LC
	JD38999/24K X XX A °	EN3645 K7 X N XX A °	TVS07RK ■■■ ## P ^ LC
			TVS07KCI ■■■ ## P ^ LC
	JD38999/24S X XX A °		TVS07RS ■■■ ## P ^ LC
			TVS07SCI ■■■ ## P ^ LC
Hermetic receptacles	JD38999/26K X XX A °	EN3645 K6 X N XX A °	TVS06RK ■■■ ## P ^ LC
	JD38999/26S X XX A °		TVS06RS ■■■ ## P ^ LC
	JD38999/21Y X XX P °	EN3645 Y0 X N XX M °	TVPS02Y ■■■ ## P ^
	JD38999/21N X XX P °		TVPS02YN ■■■ ## P ^
	JD38999/23Y X XX P °	EN3645 Y7 X N XX M °	TVS07Y ■■■ ## P ^
	JD38999/23N X XX P °		TVS07YN ■■■ ## P ^
Dust caps	JD38999/25Y X XX P °	EN3645 Y1 X N XX M °	TVSIY ■■■ ## P ^
	JD38999/25N X XX P °		TVSIYN ■■■ ## P ^
	JD38999/32W X R	EN3645 W4 X 0	BF R TV W ■■■
	JD38999/32W X N	EN3645 W4 X 7	BF RO TV W ■■■
Dummy receptacle	JD38999/33W X R	EN3645 W3 X 0	BEC R TV W ■■■
	JD38999/33W X N	EN3645 W3 X 7	BER R TV W ■■■

As example, male version without contact (except for bronze and hermetic male versions with contacts).

Caption	MIL-DTL-38999 Series III P/N	EN3645	AMPHENOL P/N
Shell size	X	X	■ ■
Insert arrangement	XX	XX	##
Polarization, rotation of secondary keyways	°	°	^

Blank lined area for notes.

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Amphenol

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